AMERICAN AGRICULTURIST

FOR THE

FARM · GARDEN · & · HOUSEHOLD

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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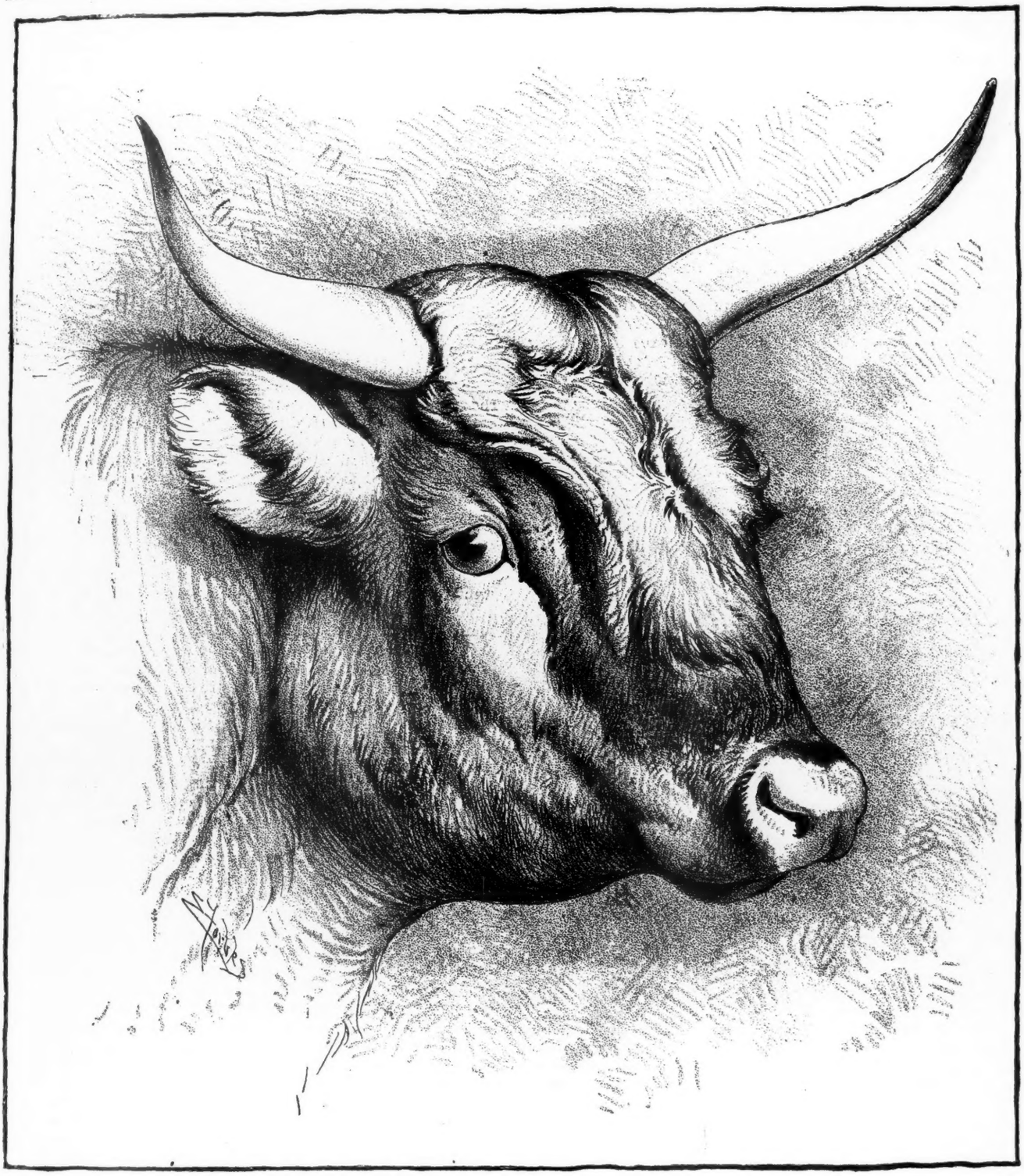

HEAD OF PURE-BRED DEXTER KERRY BULL.

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KERRY AND DEXTER KERRY CATTLE.

GEO. A. MARTIN.

THE hardy, useful race of little black Irish cattle which has for ages gleaned a meager subsistence on the Kerry mountains, has, within a few recent years, come into unwonted prominence elsewhere. Being extremely hardy and easily kept, the Kerry has long been recognized as essentially "the poor man's cow." An eminent English authority says: "I know of no breed of cattle better suited for cottage cow-keepers than the Kerry. Well selected Kerry cows produce more milk and butter for the grass and hay they consume than those of any other breed." They are especially adapted for grazing in the lanes, and will keep in good condition where a Shorthorn would starve." They are worth no more for beef than the Jerseys, but the milk yield is surprising, in view of the size of the animal, and the small amount of food required for its support. A fair average Kerry cow will give from twelve to fourteen quarts a day, and a herd was recently reported which, with more generous feeding, produced from sixteen to eighteen quarts per day each when in full flow. Others are reported as giving 4,300 pounds of milk a year. The milk is not as rich in butter fats as that of the Jersey, but will average from three and one-half to four per cent. As to color, the herd-book rules require that "Kerry bulls must be pure black, with the exception of a few gray hairs about the organs of generation in animals of exceptional merit. Kerry cows and heifers must be pure black, but in animals of exceptional merit there may be white on the under line, and a few white hairs on the tail, the white on the under line not to extend beyond the fore-leg in front, nor in width beyond the line of the elbow." Neither sex has much claim to symmetrical beauty of form, though all have many good individual points. The head is clean and fine, the eyes are prominent and bright, the often rather heavy horns are black, with white tips. The cow has a thin, fine throat and neck, rather sharp, narrow withers and back, thin tail, set on rather high, light hind quarters, full milk veins, large shapely udder, extending well forward, skin thick and mellow, and covered, in winter, with a coat of long thick hair. The legs of both sexes are fine and clean, with good feet. They are very active and agile, climbing the rugged declivities almost like goats. Having led a semi-wild life for generations, they have never acquired the gentle docility of the Jerseys, though they are not ill-tempered, as a rule, and respond very readily to kind treatment.

Such is the one native bovine race of Ireland, which has so long shared the humble life of the Irish cottager, furnishing the milk and butter which constituted no inconsiderable part of his subsistence. Its own was picked up along the trodden byways or on the rugged hills and mountains. But there is an offshoot of the breed which is less hardy, but much more symmetrical and "beefy" in form. This is the Dexter Kerry, which is doubtless the result of a cross upon the original race, though no history of its origin has been preserved. The Dexter is even more diminutive than the true Kerry, and the cows possess, to the full, the milking qualities of the original race. But the general form of the Dexter is more after the Shorthorn type—in fact, it has been justly remarked that in shape the Dexter is a miniature Shorthorn. The back is broad and level, the crops well filled, the hind quarters plump, and there is a general approach to the square form, which indicates good beef in the right place. The muzzle and entire head have a striking resemblance to the Shorthorn type (as will be seen by the excellent portrait in our frontispiece).

The Dexters are mostly black, with white on the underline, though red is recognized as an allowable color, and the red Dexters are heavier than the black. Though scarcely as good "rustlers" as the original Kerries, the Dexters are extremely hardy. Mr. G. Mander Allender, of the Aylesbury Dairy Company, near London, tells of a herd of Dexter cows which he kept all winter in an open field, with no protection but the hedge, and which came out in April "the picture of health." Two of the cows, which averaged 600 pounds each, gave thirty-seven quarts—one seventeen and the other twenty—of milk a day, and their milk yield, in a little over thirteen days, was equal to their total weight. The beef of well-fattened Dexter steers is of very fine quality, and a "block-test" is reported, in which the weight of the dressed carcass was sixty-four and one-half per cent. of the live weight. The Kerry is no longer the exclusive property of the Irish peasant and small dairyman. Its merits have at length come to be recognized by the wealthier classes in Ireland and England, and it has, within a few years, come rapidly into notice. The Royal Agricultural Society of England, and the Smithfield Club, have provided classes for it in their exhibitions, and a herdbook has been established for preserving the pedigrees and promoting pure breeding.

No considerable importations of these cattle have ever been made to the United States, though a few may be found in the vicinity of New York. Though the various breeds of cattle which have already become established seem to fill about every want, there is no reason to doubt that the Kerrys, if once well known would have a place as the family cow for village and suburban residents. Pure-bred bulls and cows may be imported for breeding purposes, free of tariff duties, if duly registered in the Kerry and Dexter herdbook.

HOT-WATER TREATMENT FOR FUNGUS DISEASES OF CEREALS.

J. L. JENSEN, DENMARK.

From various parts of Europe and Australia I have been asked whether my hot-water treatment for grain smut has also proved a remedy for rust. These correspondents have referred to a notice of such experiments in a recent number of the AMERICAN AGRICULTURIST. As far as I remember, I have never spoken of the hot-water method in connection with rust. Indirectly, the method may act in that direction, because, when the treated grain has been preserved from four to eight days before sowing—in which case visible germination should be prevented—it will sprout more rapidly, breaking through the ground from two to five days earlier than unprepared grain, the advance being dependent on the temperature of the soil. The resulting crop would, therefore, have a fairer chance to escape serious damage from rust than untreated grain sown under otherwise similar conditions. I do not think, however, that this would be of much practical consequence. If the grain were sown soon after being dipped there could be but little advance in development, and the prevention of rust by such advance would be near to zero.

Rust.—It is, however, an open question whether the hot-water method, in other ways than more advanced development, renders the plants less liable to infection by rust. If so, the method would, of course, thereby be a remedy for this disease, but to my knowledge nothing has hitherto been proved or observed to that effect. Rust in cereals is known to originate from other plants, the Barberries, Mahonias, and species of the Borage Family, the spores being carried by the wind to the grain plant. It is, perhaps, not absolutely impossible, however, that rust may also propagate directly from spores adhering to the seed, especially to the chaff of oats. But this is mere conjecture, and may not prove a reality. It is the killing of the spores on the grain used for seed that makes the hot-water treatment so effective against other fungus diseases.

Smut and Bunt.—I can testify that dipping seed grain in warm water is an excellent means of preventing smut and bunt in cereals. Hot water is far preferable to sulphate of copper, because, practically speaking, the moist heat not only completely prevents these diseases, but also augments the growth of the plant, while sulphate of copper injures the vitality of the grain. The rapid growth of treated grain renders the method very profitable, even in cases where there is no infection from smut.

Effect of Climates.—In the climate of Denmark, five minutes' dipping in warm water, performed in the way prescribed by the method, will completely, in the practical sense of the term, kill all the spores. The final temperature of the water for oats and wheat should be 129° F., for rye 127°, and for previously soaked barley 123°. In hot and dry climates, however, ten to fifteen minutes of dipping would be required to arrive at the proper effect for oats and wheat, and probably for rye. The reason for this difference is, evidently, that in such climates the walls of the spores are thicker, or more compact, and, consequently, less penetrable to water. If such grain be soaked in cold water for some hours before treating it with hot water, even three minutes of dipping will destroy all smut. Prof. Kellerman, at the Kansas Experiment Station, has proved this for America, and experiments carried out by me with Kansas oats have corroborated his results.

Cooling the Dipped Grain. — I think, however, that a mere sprinkling with cold water, say one gallon to four bushels of grain, administered some hours before the dipping in warm water, will produce the same effect. In case of sprinkling with cold water, it

would, perhaps, be advisable to lower the temperature of the subsequent hot water about one and one-half degrees Fahrenheit. For practical reasons, sprinkling would be preferable to soaking. Barley could not be thus sprinkled, for even in Denmark it must be previously soaked in cold water, in order that the hot water may destroy the naked barley smut (*Ustilago nuda Hordei*).

Improved Jensen Method.—I have changed my method in some particulars. The dipping in warm water lasts three minutes, with ten to twelve dippings during the first minute and a-half, and five to six dippings the rest of the time. After this operation the basket, with the hot grain, is placed for two minutes in a closed box. The cooling of the grain by cold water has been abandoned. The warm grain is simply spread on a floor, and immediately stirred for some minutes, in a thin layer, by means of a rake. I have good reasons to suppose that it will be favorable to the crop not to sow the grain earlier than four days after the dipping. In countries with a cool or cold spring, the preservation of the treated grain for such a time, or even longer, is not difficult, because proper stirring and shoveling will prevent visible germination, and I am inclined to think that, even in tropical countries, such a preservation of the dipped grain may be quite possible.

MORE ABOUT COWPEAS.

W. F. MASSEY, NORTH CAROLINA EXPERIMENT STATION.

What I have heretofore said about cowpeas, in the AMERICAN AGRICULTURIST, has brought me a host of inquiries from various sections. As there seems to be a great deal of interest in this crop, I have condensed here a number of these inquiries, and hope this answer will be satisfactory to all.

I cannot say, positively, how far north the culture of the cowpea can be profitably extended. In the uplands of Northern Maryland, in a climate as cold, or colder than South Eastern Pennsylvania, they do magnificently well, and I am of the opinion that they may be used with profit as far north as Central Pennsylvania.

When grown for the seed they are sown in drills, rather farther apart between the rows than the white beans are grown in New York, say three and one-half feet, for the vine growth is very large. When grown for hay and grain manure they are sown broadcast. If the land is light and poor sow two bushels per acre, on fresh plowed land, and harrow in. On strong land one bushel will be sufficient.

The feeding value of the hay made from cowpea vines is greater than that of clover hay. They are hard to cure, and the best plan is to put them in tall narrow cocks made around stakes stuck in the ground, just as peanuts are cured in the South. Rain will not hurt them as much as it does clover, but they are better without it. The hay should be put in the mow while still tough, for if handled when dry the leaves are lost as badly as they are from dry clover hay. The time to cut them is as soon as well podded.

I consider it much better to mow the crop, and plow only the stubble for wheat. They must be plowed under so late that it is difficult to get the seed bed in a sufficiently compact state for the wheat crop. Then, too, the crop of hay is worth more for cow feed than it is for manure, for it has been demonstrated that the capture and fixation of nitrogen as nitrates in the soil is effected in the roots of leguminous plants.

As to the fertilizers to be used, it depends largely upon the character of the soil. I have found that on the Piedmont red clays of Virginia and North Carolina that plaster (sulphate of lime) will release the potash in these soils and give it to me more cheaply than a direct application of potash salts. On the coast, in soils deficient in potash, I would recommend, for wheat, 300 pounds acid phosphate, and 100 pounds of kainit per acre for the wheat crop.

The seed is sold by all the seedsmen in Southern cities, and by the leading dealers at the North, also. The price varies with the crop from one to three dollars per bushel. There are a number of varieties used. I have generally used the Black pea, and believe it to be as good as any.

It must be remembered that the Southern field or cowpea is not a true pea, but a very tender bean of tropical origin, and it should never be sown until the ground is warm. Here, we sow from the first of May to July 15th. In the latitude of Central Pennsylvania June is early enough. The great advantage of the cowpea lies in the fact that it can be grown on soils that will not grow clover at all, and can be used when clover has failed, so as to quickly give a preparation for wheat. The hay, when well cured, is the best food, in the shape of hay, I ever used for milch cows, and it makes the best of ensilage. Cut and mixed with corn ensilage it makes, from its nitrogenous character, a complete ration, which corn ensilage does not. Of course cowpeas cannot take the place of clover, at the North, but in all the Southern Coast plains they not only take the place of clover, but are far more valuable than clover. Any one north of Maryland should try them in a small way and test their value in his soil and climate before going largely into their culture.

THE HOP-PLANT LOUSE DOES NOT HIBERNATE IN THE GROUND.

In the hop-growing regions of the far Northwest, all discoveries in reference to the life history of *Phorodon Humuli*, as the hop-plant louse is scientifically known, have great interest for the people engaged in the hop industry. A recent number of the Seattle, Washington, *Post Intelligencer* contained an item announcing that the stem-mother of the insect in question had been found in the earth at the roots of the hop plant. When specimens of the alleged stem-mother of the hop-plant louse were sent to Professor Riley, the Government Entomologist, they proved to be an underground form of another plant-louse belonging to the genus Tychea which has no close relation to the hop-plant louse, but belongs to an entirely different sub-family. All sorts of insects can be found at the roots, or near the base of the hop vine during the winter months, a fact which has often misled not only practical hop growers, but other investigators, and the ideas that have been promulgated in Washington are but repetitions of those that prevailed farther east, and in Europe prior to the exact observations and discoveries by which Professor Riley has given us the true winter history of the insect. Only the most careful and competent study of the insects found in the ground will prevent the investigators from falling into the earlier blunders made in America, and other parts of the world. The winter egg occurs only upon plum, and it is upon this plant that the stem-mother will be found in the spring, and spraying the plum trees shortly after the foliage puts out, is, without doubt, by far the best preventive measure which we have.

PROFIT IN HOME-RAISED GRAIN.

G. JOHNS, OHIO.

There is much discussion in regard to the raising on the dairy farm of the grain that the dairy needs, and thus becoming independent of the grain dealer. The cow, to do her best, must have a certain amount of nitrogenous food, or the ration will not continue to have its proper sustaining power, the cow dropping off in milk, and taking on fat. There is no failure as a rule, to supply the cow with needed forage, which is on the side of the starchy elements. The want is in the protein, which is the costly part of the ration, and supposed to exhaust the soil the most.

Some economists say that what is raised on the farm is worth just what it sells for, hence it is as cheap to buy, as to produce! The real question is, shall the farmer depend upon his dairy to produce the total supplies of the farm, or shall he put some labor into crops and supply the needed protein? Just now the great demand for nitrogenous foods has greatly increased their cost. It is a matter of doubt, if, at twenty-four dollars per ton, they return any profit to the dairyman. The growing of oats and peas is now being advocated, by many, as the better way. Oats, alone, are not an ideal milk-producing food, and, unless peas are the coming crop, the problem is far from being solved.

Whether it is wise for the farmer to expect to realize a double value, feed and manure, from purchased grain is a question that each farmer must decide for himself. That it will pay to raise oats and put the money into cheaper bran is a question. The writer did so last winter, and he thinks with a profit. Employment was thus given to the farm help in summer. The oats purchased three tons of middlings for each two tons of oats, and, pound for pound, they proved a better grain to produce winter milk. The oat straw made good feed and bedding for the cows.

If peas have the value that is accorded to them they must pay to raise for cow feed. The statement is now made from high authority, than an acre of peas, yielding one ton, has a feeding value of 5,500 pounds of best bran. This is a most important thing to know, and act upon, as it puts the milkman on ground independent of the grain dealer, and enables him to produce a large amount of protein on a small area. It may be possible for the farmer to devote this land to some better paying crop and use the yield to buy the protein that is needed. At present prices three tons of bran

are worth sixty dollars. Potatoes being worth thirty cents, it would require 200 bushels of them to buy the feeding value of thirty-five bushels of peas. The cost to cultivate the peas would be small. The cost to harvest them would not be greatly different from the potatoes. To grow wheat to buy protein with would be a loss, and to sell the 100 bushels of corn on the acre is in the same line. So this brings us back to the first question, shall we raise the protein and thus give a proper rotation to crops and a certain amount of farm employment? In my opinion dairy farmers are benefited by raising all the grain they can, and they thus save all or a part of the money otherwise paid out.

ROAD DRAINAGE.

JOHN M. STAHL, ILLINOIS.

The one thing necessary to a good road—earth, gravel, macadam, or paved—is thorough drainage of the foundation. Money has been misapplied in road-making because of neglect of thorough drainage, even when the money has been used to build roads of a material that should give them a permanent character. On the Western prairies, where the natural drainage is poor, undrained gravel roads have suddenly become mud roads when put to the severe test of a long rainy spell in winter and early spring. Not the least unfortunate result of this has been a prejudice against gravel roads in particular, and a scarcely less pronounced distrust of permanent roads in general. Lack of drainage was the real cause of the failure.

Whether the road is to be of earth, gravel, or macadam, the earth roadbed should be graded, crowning it twelve to fourteen feet wide, and twelve to eighteen inches higher in the middle than at the edges. Along each edge should be cut a shallow ditch. This is a correct general statement, which, of course, should be modified to suit peculiar circumstances. Thus, in a very hilly country, especially if the soil washes easily, the ditches should not be cut at the sides, as they are not necessary, and will become serious gullies. In a hilly country it is not necessary to crown the roadbed so high, but the crowning must always be sufficient to insure ready surface drainage. Twelve to fourteen feet in width is sufficient. Making the road wider has been found a needless expense.

With those soils and subsoils specially well adapted to drainage, crowning the roadbed and cutting the ditches at the sides will secure the necessary drainage; but where the soil and subsoil are not favorable to drainage, additional measures must be taken. In the country in which I reside, a gravel road has been made for twenty miles, near the Mississippi river bluffs. This road is on a soil and a subsoil decidedly gravelly, giving splendid drainage. This gravel road is now eighteen years old, and has proved satisfactory. The only means taken to secure drainage was to crown the roadbed a little in low places. To make a gravel road in this way over the greater part of the same country would be a waste of money, for in most places the soil is a black prairie loam, and the subsoil a tenacious clay.

It has been found quite satisfactory in most localities, having a black surface soil and clay subsoil, to lay a drain of tile along each side, near the edge of the roadbed. This has been found a better location than near the middle of the roadway. The office of the tile is to carry off water brought up from below rather than water sinking in from above. In some localities it is necessary to use three drains—one line of tile beneath the center of the roadway, and one under each ditch at the side. It seems unnatural to put the tile under the side ditches, but this location has been proved best.

When the roadbed is to be graveled or macadamized, the crowning earth foundation should be nicely smoothed and then rolled until quite solid. It is well, also, in this case to put the clay subsoil from the ditches on to the surface. When rolled, it makes a hard, smooth surface, almost impervious to water, and over which will flow, off to the ditches at the sides, the rainwater that may sink through the gravel or macadam. When the surface is to be of earth only, the clay subsoil should be kept underneath, and the natural soil be placed on top. The surface soil will usually afford much better drainage than the subsoils, and make a better road surface.

Damage to Valuable Documents. — Some time ago, Professor Riley, Government Entomologist, was called upon to investigate the damage done to various valuable documents in the file room of the Treasury Department at Washington, with a view of recommending some preventive or remedial measures. An inspection showed that the injury was done by the Croton bug, (*Periplaneta americana*). The books attacked had been recently bound, and the roaches were attracted by the presence of the fresh paste, of which they are extremely fond. Professor Riley recommended the use of poisoned paste, and the free use of California buhach in the file room thereafter. The recommendation has proved entirely satisfactory, and no further trouble has been experienced.

THE HOT WEATHER CHEESE.

JOHN GOULD, OHIO.

July seems to be a month of worry and trouble for the average cheese maker. Work as he will, order as he may, the cheese are all the time going wrong, until the maker is ready to charge season and patron alike for shortcomings. These difficulties may be overcome, and July cheese take equal place with the cheese of any other month. At the present time, a cheese made July 9, 1891, is being consumed in the writer's family. For texture, quality, fine flavor, and buttery content, it is the finest cheese that it was ever my good fortune to enjoy. It was made of whole milk, by the ordinary Cheddar method, but instead of using three ounces of rennet extract to 1,000 pounds of milk, nine ounces of extract were used. This excess of rennet did not cure the cheese any faster than two and three ounces did other experimental cheese made at intervals during the summer of 1891. In all, 175 cheese were made between July 9th and September 10th from milk divided into three lots, and coagulated with three, six, and nine ounces of rennet extract to 1,000 pounds of milk. The cheese were put on ranges in an ordinary curing room where the temperature reached 85° F. on several occasions.

All these cheese cured uniformly, though the cheese with the excess of rennet has the finest flavor. What cures cheese? The old idea was that rennet, being a digestive agent, the curing of cheese was a digestive process, and hence, that the maker could hasten or retard the curing by the amount of rennet used in coagulating the milk. But in these experiments the curing was uniform. Rennet contains the milk-digesting ferment of the calf. It is a chemical ferment, or enzyme, and differs from the plant ferments or bacteria, in not reproducing itself. It is made by the stomach cells. Cheese is cured by plant ferments, or bacteria, which increase like yeast. More than 100 cheese were made from the divided milk of a vat, and the results of the excess of rennet in hot weather were always on the favorable side.

These experiments in cheese making have been carried on for two years, under the personal charge of Prof. J. W. Robinson, of Ottawa, Canada, Dairy Commissioner of the Dominion. The Professor believes that rennet digests the milk into curd; that the curing of the curd into cheese is the work of bacteria which are influenced by moisture and heat; that the curing of cheese is due to these ferment germs, and that the cheese maker needs to become skillful along certain lines of knowledge that have to do with bacteria, quite as much as with rennet action. In the use of rennet of different amounts, the Professor found but little difference in the amount of cheese that could be made from 100 pounds of milk. With three ounces, 10.66 pounds of cheese were made; with six ounces, 10.67 pounds, and with nine ounces, 10.68 pounds. In a parallel test, the milk was divided into three batches, and two ounces of rennet to 1,000 pounds were used in all three vats, and the yield to the 100 pounds of milk was: 10.50, 10.50, 10.62 pounds, respectively, as an increase of rennet hastens the formation of curd. The Professor thinks that in hot weather more rennet will be used to make the curd before an excess of acid is formed. The rennet action upon curd and cheese curing is a matter that opens up a wide field for investigation and experiment.

If curing cheese is the work of bacteria, rather than of rennet-digestion, the most exacting cleanliness must be observed about factories, and all the apparatus connected with them. It is possible that much of the bad luck that is noticeable about some cheese factories is not the night work of the Brownies, but the maker's own negligence in allowing filth and slop to collect about the building until the air is laden with the germs of those ferments which spoil cheese.

Changing Stream Channels.—Natural water courses which cross the farm can be readily straightened by always making the new channel a little deeper and wider than the old one. Do not think the action of the water will enlarge a small channel, for nine times in ten disappointment will be the result. The changing of water courses of small streams is often of great value, increasing the tillable land and improving the appearance of the farm.

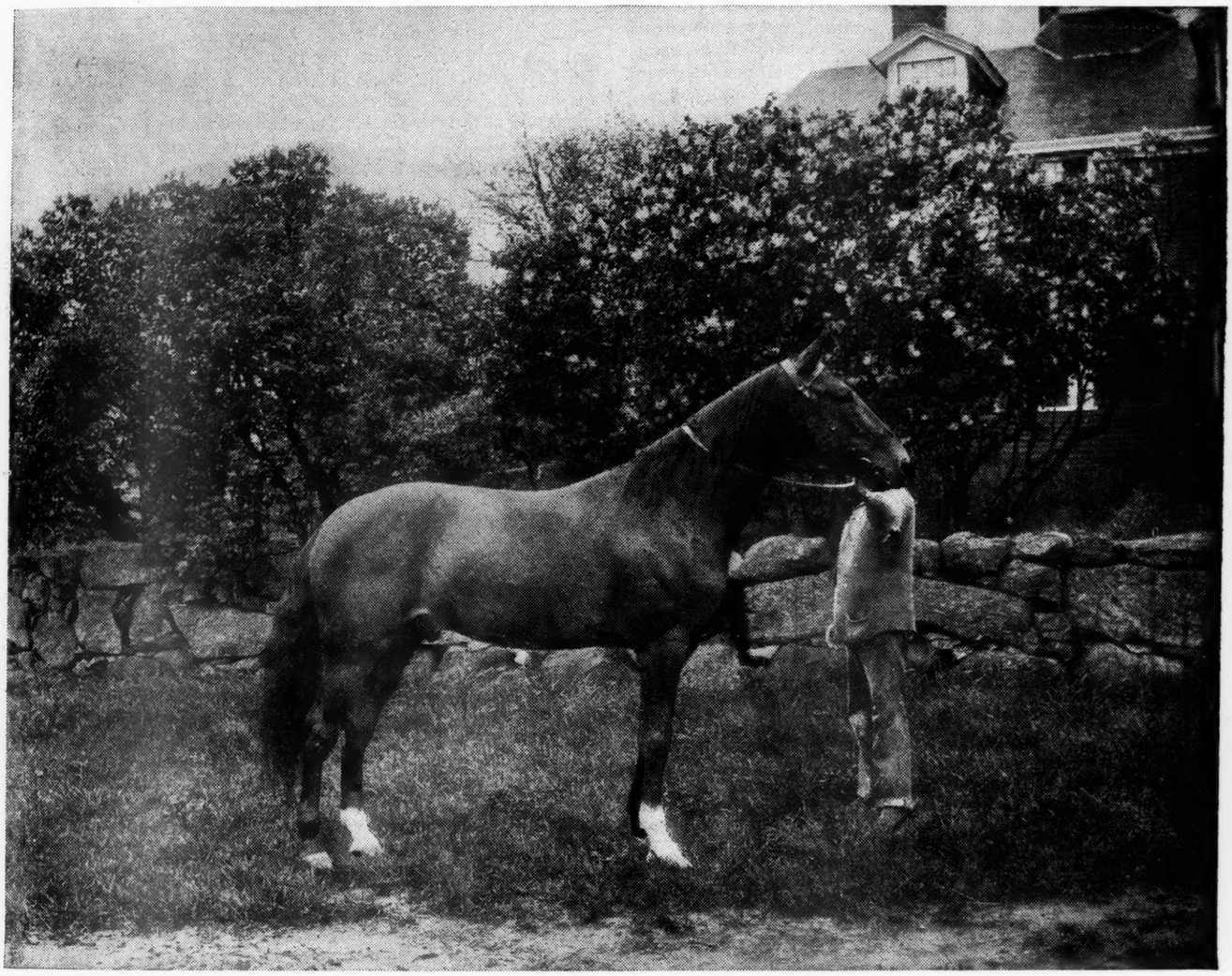
THE UNBEATEN EDGEMARK.

E. C. POWELL, MASS.

The unbeaten Edgemark, as he is known, is a wonderful young horse, perhaps not as great as Arion, Axtell, or Allerton, but well up in line with the famous horses of the present day. His record of 2:16 was obtained when he was four years old, which equaled the record for that age, then held by Manzanita, and made him the champion four-year-old stallion of the world, which title is now held by McKinney, 2:12¼. It was nearly three years ago that Col. H. S. Russell, proprietor of Home Farm, Milton, Mass., started out in search of a trotting stallion. He went to California to look at Ansel, record 2:20, and other of Senator Stanford's horses. None of them suited him, so he came home and paid a visit to Kentucky where he heard of an invincible three-year-old that had started in a number of races and won them all. Col. Russell saw him and liked him so well that the colt became his property for something less than $15,000. Edgemark had a record of 2:33 as a two-year-old. When three he started six times, five times in races with other horses and once against time. He made a mark of 2:23¾ in a race against seven others including Quartermaster, 3:21¼, who was described in the AMERICAN AGRICULTURIST for April of this year. At Lexington, Ky., on Nov. 9, 1888, he made his three-year-old mark of 2:21. He passed a season in the stud in 1889 and was then taken to Kentucky to beat the 2:19¾ of Repetition, the four-year-old stallion record at that time. He accomplished the feat with the greatest ease, going the mile in 2:16. He has not started since then, but has done noble service in the stud.

The type of horse, of which Edgemark is a magnificent representation, is one which all breeders of speed horses should study and secure. Of good size, fine conformation, strong build, handsome outline, splendid action, speed and general excellence, Edgemark is an almost perfect example. In breeding for this class of horses, if one does not get a fast horse, he will still have a fine driver or a horse able to earn his oats at almost any kind of work.

Edgemark is a beautiful bay, with black points, and stands fifteen hands and three inches high. He is very strongly muscled, and has the best of limbs, strong pasterns, clean hocks and good feet. His neck is of good length, and well set on a magnificent pair of shoulders. His head is clean cut, medium in size, and with a bright, intelligent and courageous pair of eyes. He has large chest room, and in his whole make-up it would be difficult to find a weak or faulty spot. His pedigree is fully as strong as his anatomy and in him is a judicious blending of the Hambletonian, Clay and thoroughbred strains. The thoroughbred is so plastic and so sandwiched between the other two that even the strongest advocate of pure trotting crosses can hardly object to this rare combination. The sire of this grand young horse is Victor Bismarck, 326, who is the sire of nineteen trotters with records better than 2:30, three of them better than 2:20 and two pacers better than 2:25, which is the standard for them. That the get of Victor Bismarck are successful sires is shown by Melrose, who is the sire of six trotters in the list, one of them being the game chestnut gelding T. T. S., 2:19½ that has trotted thirty-eight heats in 2:30 or better. The sire of Victor Bismarck is Rysdyk's Hambletonian, to whom nearly one thousand 2:30 trotters trace directly, and his dam is Hattie Wood, also the dam of Gazelle, 2:21, Idol, 44, and Louis Napoleon, 207, who is the sire of Jerome Eddy, 2:16¼ and thirteen others. Hattie Wood is by Harry Clay, 45, and he by Cassius M. Clay, Jr., 20 (Neaves'). On the dam's side Edgemark is also well bred, tracing back four generations and more. His dam is Edgewater Belle by Edgewater who is by Curtis's Hambletonian, 539, and he by Rysdyk's Hambletonian. The dam of Edgewater is a daughter of Kavanaugh's Gray Eagle. The dam of Edgewater Belle is Easter



EDGEMARK, THE FAMOUS FOUR-YEAR-OLD STALLION.

by American Clay by Cassius M. Clay, Jr., 22 (Strader's). Edgemark has no colts that have been trained, although some will be this season. He has a number of yearlings and two-year-olds that have inherited his shape, size, color and speed. I saw a yearling by him recently that resembles him greatly, and is very promising.

THE DEVELOPMENT OF BEE CULTURE.

PROF. A. J. COOK, MICHIGAN AGRICULTURAL COLLEGE.

It is doubtful if any manual labor pursuit can show as rapid and substantial progress for the last fifty years as can bee-keeping. The whole business, methods, manipulation, and entire care and management of bees, have been totally revolutionized. Fifty years ago the old box hive, or "straw skep," or "bee gum," or very likely the old salt barrel, served for hives. Comb honey was produced in the body of the hive, or, possibly, in large boxes on top of the hive, and was generally a combination of honey, bee bread and, possibly, young bees. Then all liquid honey was strained, and was an extract of the above. Then there were no bee books worthy of the name, for Langstroth and Quinby had not yet taken their pens to record the marvels of the hive, and the improved methods of honey production. Then the only literature was Huber and other foreign works, which were very rare in American libraries. Even the agricultural press was almost silent on this subject. The whole business was so rudely carried on, and so restricted in its limits, that the most enterprising editor could not get information that would be helpful to his readers. Then the words, movable frame hives, sections, honey extractors, comb foundation, supers, not to speak of queen cages, bee escapes, smokers, etc., were entirely unknown.

The Movable Frame Hive.—The movable frame hive, the invention of the scholarly Langstroth, is not yet forty years old. This at once revealed the marvels of the bee world to every observing bee-keeper. He no longer worked in the dark; he could look in upon the entire economy of the hive, and knew the needs and conditions of his bees as truly as the farmer could know of the thrift or unthrift of his horses or cattle. Of course this meant revolution, and bee-keeping at once changed from a happy-go-lucky pursuit to one that was largely under the control of the bee-keeper. Soon the excellent books, "Quinby's Mysteries of Bee-keeping" and "Langstroth on the Honey Bee," came to explain the new and better methods. The first gave, in plain, simple style, the methods of one of the most practical and successful bee-keepers that America ever produced. The other was a veritable classic. It gave, in the most elegant diction, not only the marvels connected with the natural history of the bee, but pointed out the path, through a study of the bee's habits and history, to a better and more successful system of bee management. Thus the revolution in bee-keeping methods was quick to spread, and soon every State, and very many counties, had bee-keepers, who not only knew but practiced the best that was taught in this fascinating field of work. About twenty years ago our first bee associations were formed. To-day we have hundreds of these organizations, even single States having well nigh a score. The National Association is very vigorous and influential.

The Honey Extractor.—About twenty-five years ago Germany gave us the suggestion of the honey extractor. The inventive genius of Americans had no sooner secured the idea than they hastened to change the rude instrument into the perfect machines in use to-day. These give us the beautiful extracted honey, which is just as excellent, perhaps more wholesome and digestible than is even the immaculate comb honey. By this means we have nearly twice as much honey as we can secure in the comb, and the increase tends greatly to lessen the prices of this incomparable sweet. Thus we have another revolution which cheapens honey, and at the same time takes away none of its excellence. The extractor also prevents swarming, one of the things that the bee-keeper desires to control, but knows no sure way except by use of this valuable machine.

Comb Foundation and Other Improvements.—Soon after the invention of the extractor, Germany again came to the front with comb foundation. This article was so improved in America that it became hardly second to the extractor as a valuable adjunct in the bee yard. With this we get only worker combs, which are straight and true, and secure a much larger and finer product from our apiaries. Even before these last improvements the smaller sections became favorites, and before the foundation was in full use we also had the White Poplar sections, which hold a pound of comb honey, all so white, so neat, and so clean, that to show them is to sell them. Thus, though the honey product is increased from thousands to millions of pounds, the markets are not overstocked. People admired and desired honey before; now they regard it as one of the most attractive luxuries of the table. To-day we have our queen excluders, so that no bee bread is stored and no breeding done where we secure our comb honey. To these have been added the bee escape, bee tent, and smoker, so that we can manipulate our bees as safely and as easily as we can manage the most docile horse.

Breeding.—The science which has ever kept the lead of practice in bee culture has discovered that the laws of breeding hold just as truly among bees as among our higher animals, that there is quality among bees, and that by selection we may greatly improve our honey bees. Thus queen rearing, a thing entirely unthought of fifty years ago, is now an industry in itself, and bees are bred with all the care and success that waits on the best breeders of horses or cattle. More than this, these queens are shipped around the world. Men have studied out the requirements, so that now we have cages and food that make it safe to send bees to Australia and Japan.

Wintering and Diseases.—Twenty-five years ago the matter of wintering bees was a sore puzzle. Thousands of colonies were often lost in a single winter, but now, thanks to hard study and thought, we have almost no dread of winter. Again the deadly microbe attacked the bees. This is a sort of cholera that is terribly contagious and as terribly fatal. Yet our bee-keepers have studied out the nature of this malady, and to-day we know how to stay this "foul" brood, which is one of the most virulent of maladies.

One Barrier to Certain Success.—There is just one serious impediment in the way of perfect success in bee-keeping. As yet, we do not know how to secure honey when the flowers do not secrete nectar. For the past few years the honey seasons have been very poor, and in most sections of the country the honey crop has been very disappointing. Whether the keen eyes of science or practice, or both, will ever discover a way to remove this one remaining barrier to certain success remains to be seen.

Bees and Fertilization of Flowers.—One aspect of bee-keeping in which the farmer and fruit grower may well take a deep interest is the necessity of bees in the work of fertilization of the flowers of most of our fruits. We positively know to-day that bees not only give us honey, but, in gathering the nectar from the flowers, they perform a most valuable service, without which a full, or even profitable, fruitage cannot be expected or hoped for. Thus the importance of bee-keeping becomes greatly augmented. We see that Nature is a grand whole, that each part is in some way related to every other part, so that failure in one line often means general failure. We have in apiculture a fine illustration of this truth. Agriculture, the hope of our country, can only attain the highest development through the success of apiculture. As the bees must have the flowers, so the flowers must have the bees.

Science and Art in Bee-Keeping.—Bee-keeping combines science and art as do few manual-labor pursuits. The progressive bee-keeper must understand the natural history of bees, and, therefore, he must be a student and a thinker. He must use constantly his best mental faculties as well as brawn. Thought and study, when combined with physical effort, bring real satisfaction and insure enthusiasm. Thus the bee-keeper is a student and an enthusiast, and is mentally very wide-awake. He is prepared to lay hold of new and better methods, which are sure to be suggested to the man who is mentally alert, to see all there is in and about his business that will help him to a higher position. This explains the fact that hardly a year goes by without some new method or device which is fairly revolutionary in its influence on bee-keeping practice.

THE USE OF EDIBLE OILS.

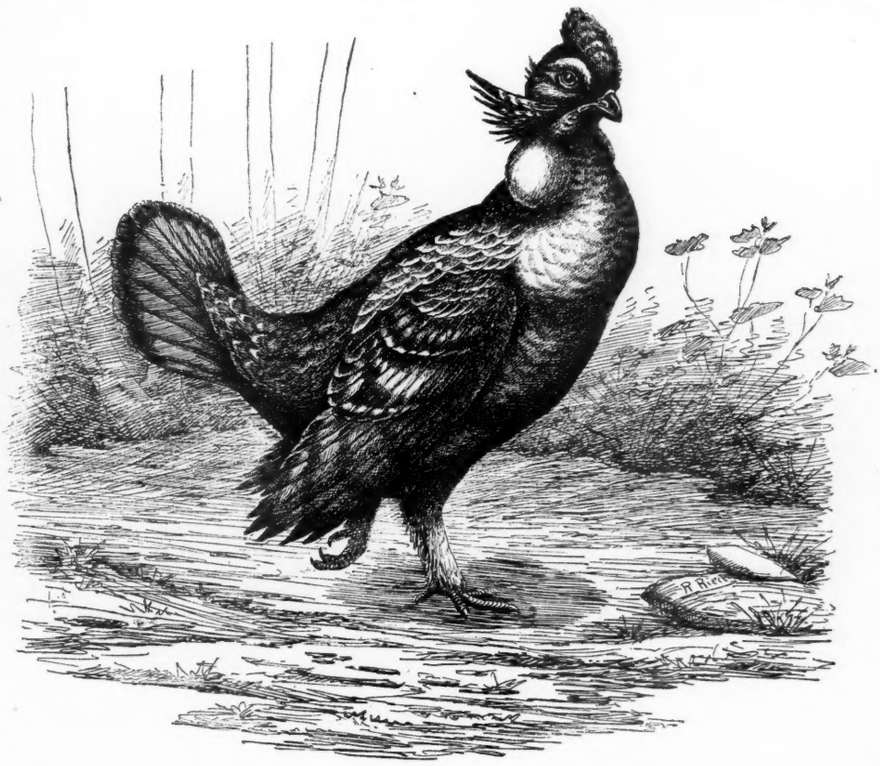
HENRY STEWART.

The cultivation of various plants for the production of oils to be used as food has been a leading industry from time immemorial. No history carries us back to the time when the olive was first used for its oil, and the importance of this culture is indicated by the numerous references to the olive as a symbol of agricultural wealth, not inferior to the milk and honey with which "the land of promise" was said to flow. But of late years this ancient industry has been almost demolished by the introduction of new processes, by which other oils are substituted for the older kinds, and the ancient groves, which gave wealth to the owners during uncounted generations are now cut up for fuel. And many other sources of materials for the manufacture of edible oils are being driven from their position by the same competition of the cheaper and equally suitable oil of cotton seed. But a few vegetable oils possess such desirable qualities for technical purposes that they are maintaining their position, and

a few are even increasing in demand for special purposes. One of these is the oil of the sunflower, which is used not only for food, and the preparation of it in several ways, but in several important industries in which it has superseded all other oils. Its bland quality and its freedom from injurious acids render it desirable in the lubrication of fine machinery, as for clocks and watches, and also for the uses of the artist as a medium for his colors. Other uses are being found for it, which cannot be filled by any other kind.

The plant itself, too, has other valuable uses. The stalks make serviceable fuel, and are cheaper than wood where the plant is most easily grown, as on the broad plains of Europe, Asia, and in our Western States. The leaves are good fodder for cows. The cake left from the oil press is an excellent fattening food for beeves and milch cows, and the seeds are a better food than any other grain, being worth, for feeding, $1.60 per 100 pounds, against $1.11 for corn, and having a better nutritive ratio than any other oily seeds. The seed contains thirteen per cent. of protein and twenty-four per cent. of fat of irreproachable character for feeding, and its nutritive ratio is seven and two-tenths of carbonaceous matter to one of protein, and thus is a better balanced food than other oil cake. The cake is worth $1.93 per 100 pounds, which is more than the value of linseed cake, and contains twenty-seven per cent. of protein and eight per cent. of oil. The ashes of the whole plant have thirty-five per cent. of potash, which is equal to one and nine-tenths per cent. of the dry stalks. This fact is the key to its culture, for which, soil that is rich in this element is indispensable for its continued growth. But, as the broad open plains, over which the annual fires have swept for centuries, are especially rich in potash, the plant is there grown in the greatest luxuriance. An average yield is twenty-five bushels of seed per acre, and, at the common price of one dollar per bushel, this is quite profitable, considering the value of its leaves and stalks. There are two varieties of this plant, the mammoth and the small-seeded kind; the latter, being the richer in oil, is mostly cultivated for this purpose. The large-seeded kind is used for feeding, and also for eating as a luxury, much as the peanut is with us. The plant has been cultivated as a farm crop only since 1845, when it was first grown in Southern Russia. Now the industry has spread all over the Southern Provinces of that great Empire, and is continually spreading. It is a high tribute to pay to the oil to say that it is superior to our cotton-seed oil, knowing that this has displaced the best brands of the fine olive oils of Spain and Italy. As the plant succeeds to perfection in the Western Prairie States, where sheep may be kept with the most profit, and as the leaves and the whole heads are eaten by these and other animals, and as the cheap-fuel question is an important one in those States, this crop deserves especial attention by the Western farmers.

The mode of culture is the simplest. The seeds are planted precisely as those of corn, and the land is simply cultivated so as to be kept mellow and free from weeds. The harvest is in no way exacting as to time, as the heads droop and are protected from the rain, and the seeds are firmly held and do not drop out from the heads. The heads may be gathered and the stalks left in the fields, to be taken up at convenience for use as fuel. It is also possible, and even desirable, to seed the land with clover at the last cultivation of the crop, and make it a member of a larger rotation, to be followed by the clover, which affords either hay or pasture, or both, and then a rich contribution of plant food to the land. The plant thrives well in the South, and on the common micaceous soils, which glisten in the sunlight by the innumerable scales of mica, and are also full of feldspar—another potash mineral. Each stalk will bear several heads, full of seeds, and a yield of fully sixty bushels of seed to the acre may be counted upon under favorable conditions.



THE MALE PINNATE GROUSE.

THE PRAIRIE HEN.

H. S. BABCOCK.

Among our native wild birds, there are a few that seem worthy of domestication, as they possess economic qualities that are of value. Among these there is none that seems more worthy of a systematic attempt at domestication than the pinnated grouse, or prairie hen (the male of which is herewith illustrated). Its general color is yellowish-red, with black markings. It has a short and rounded tail. The male has two remarkable characteristics: the neck-tufts, composed of long, narrow feathers, sometimes measuring five inches in length, and the pouches of wrinkled skin along the neck for two-thirds of its full extent, which are capable of inflation, and, when filled with air, resemble quite closely medium-sized oranges. This resemblance to oranges extends not only to size, but to the color and peculiar surface of the fruit. In the winter the birds congregate in large flocks. In summer these flocks break up into smaller bodies, dispersed, probably, for the better performance of the operations of hatching and rearing the young. As the breeding season approaches, the males strut about like turkey cocks, dropping their wings to the ground, erecting the feathers on their necks and inflating their orange-like pouches. At this season, many meet in certain places in the western part of our country, about daybreak usually, and engage in their displays to attract the females, ending in severe battles. When the sun is up, the conquerors and conquered retire from the field. The pinnated grouse was once common in New Jersey and Pennsylvania, as well as on the prairies of the West, but, like the Indian, it has disappeared before the advancing wave of civilization. Its food is not dissimilar to that of domesticated poultry, or what our domesticated poultry would obtain, if compelled to shift for themselves. It feeds upon seeds, berries, buds of trees and bushes, insects, and the like. The flesh of this bird is good, and in the parts of the country where it is rare, is highly prized.

Could it be domesticated—and it is by no means impossible that it could—there would be added to the feathered stock about the farmyard a fowl with excellent flesh, a new figure to please the eye, and probably a fairly-good layer. It now lays quite as well as the original bird from which domesticated fowls are supposed to be descended, and, under domestication, its laying powers might be equally increased. In its wild state it shows more or less variation, and as variation is increased under domestication, if it were domesticated its size might be enlarged, its color and markings more or less changed, its figure modified and its prolificacy augmented. In this way its economic properties might be greatly improved, and it might be found to be fully as useful and profitable as the fowls that now supply our table with delicate flesh and eggs.

RUSTIC WORK.

JOHN DE WOLF, SUPERINTENDENT PROSPECT PARK, BROOKLYN, N. Y.

When appropriately located and properly constructed, rustic work finds a fitting and suitable place in many gardens and parks. Near fine buildings and in trimly kept grounds it is out of place;

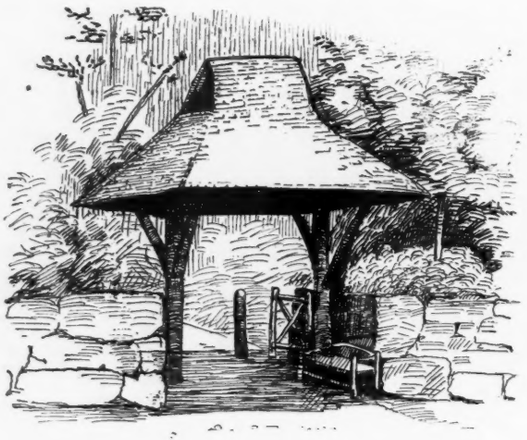


FIG. 1. COVERED GARDEN GATE.

here architectural structures are better. Most of us, however, have not this objection to urge in favor of our own places, but have situations where something of a rustic character is admissible. Especially when there are children visitors, or boarders to amuse or entertain, is it desirable. A well placed and constructed rustic shelter or arbor will often be as much occupied during hot weather as any room in the house, and be a great relief to the housekeeper. The best designs cannot be arbitrarily decided, but should be suggested by conditions and situations. It is doubtful if any structure, besides the house, is often desirable in small grounds. A little summerhouse is nearly useless; a large one takes room and makes the place seem small.

A covered garden gate, as seen in Fig. 1, with seats at the sides, serves a good purpose, and is easily modified to suit other places. As rustic structures are only occupied in warm weather, it is a mistake to have the sides closely built, or so covered with vines as to prevent the circulation of air, and make a harbor for insects. Sometimes, in exposed places, it is well to inclose some of the sides against high winds, but in sheltered spots the upper parts are best left open, as in Fig. 2, a garden house with a straw-thatched roof. When much occupied a good board or cement floor is best. It is well to pay especial attention to the proportions and outline of the roofs, the most conspicuous thing about them, and have them steep enough to shed rain easily. Roofs should be of generous proportions, with eaves projecting far enough to afford ample protection against sun and showers, or there will be little comfort under them.

FIG. 3. RUSTIC SEAT.

Guard against having the eaves so low as to obstruct the view while standing inside. A similar design was carried out on an exposed hilltop, with great satisfaction to the owners. The trunks of eight straight oak trees, about ten inches in diameter at the base, and somewhat smaller at the top, were saved when the woods were thinned out on the side of the hill, and form the supports for floor and an eight-sided roof of shingles. Six feet from the ground a board floor was built in, and the whole structure braced from the center, and steadied by a wall of heavy stones built about the uprights as high as the floor. A flight of steps, balustrade and railing, made from the branches of the trees, completed it, and it was furnished with seats, fixed and movable, and a table. At this height the view is unobstructed, while the stone ballast prevents unpleasant vibrations.

The combination of weather-worn stone and bark-covered wood is a pleasing one. Fig. 3 suggests one that is greatly admired. Instead of four wooden supports, the back is built of stone, with the ends carried up in rough piers, with stones between arranged like an inverted arch. The piers support the ends of a straw roof with a longer slope than the part in front. Fig. 4 represents an idea that has been carried out in the garden at Lake Mohonk. The unsightly stumps of trees, taken from the ground and piled together, form the foundation, while the root of a small cedar tree, turned upwards, makes the center pole. The whole, stumps and structure, are thickly entwined with a growth of the common hoary clematis, making an object of great beauty over an ugly frame. The use of vines on rustic work is most appropriate and fitting, but they are purposely omitted from the accompanying sketches in order to show the construction. Another example from the same locality is the umbrella, Fig. 5. A strong center pole supports a frame of saplings, in general construction like an umbrella frame, on which is a straw thatch, making one of the most unique rustic structures possible. Another more easily constructed one is sometimes called a wigwam shelter. Three or four tree trunks are securely fastened together near their tops, with their butts spread apart, while at a height that will be above the heads of tall people

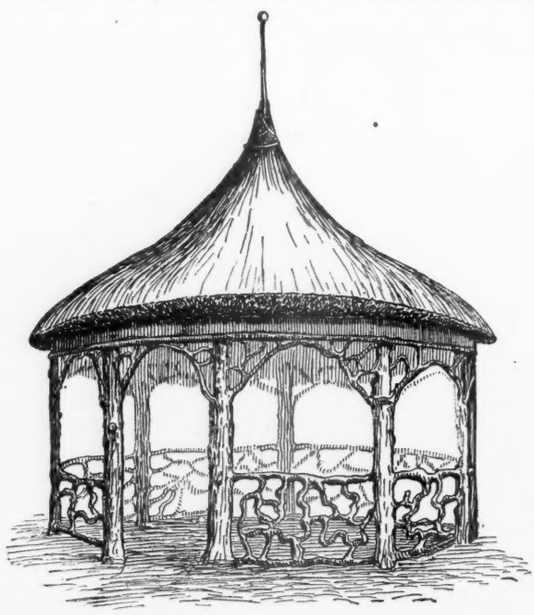


FIG. 2. GARDEN HOUSE WITH THATCHED ROOF.

is nailed a cover of straight branches. This is suitable for a situation difficult of access, where shade is wanted for hot and tired pedestrians for a short time only.

The illustration, Fig. 6, engraved from a photograph, represents an arbor consisting of a roof-like lattice between living trees, made from red cedar. A long center pole was placed in an upright position on the ground; beneath the middle and the upper part make a center piece for the frame, as shown in the engraving, all of the pole below the frame being sawed off and removed after it was completed. Cleats are nailed on the trees, on which the main supports of the frame rest, being nailed to them at one end only, which allows for a short motion that the trees have, in high winds. Without this precaution, it would be broken and weakened by gales, although ordinary winds give good-sized tree trunks no perceptible motion. The frame, being strongly braced in every other direction, is perfectly secure when supported from below and covered with a hanging mantle of Woodbine or Virginia creeper, which ran up the tree trunks and covered the frame in the one that suggested the sketch. It will be hard to contrive a prettier arbor than the one on this plan. The grass grows under it freely, and movable seats are kept in the shadow. A grove of locust trees, crowded together, stood on the spot once. These were all cut out excepting the four standing in available positions. Variations of this idea could be made according to the position of the trees and the available material. Summer, between haying and fall work, is usually the time

rustic houses must be built, but winter or early spring is the best time to make movable pieces under cover, seats, gates, tables, etc. When the woods are free from growing leaves is the time to see and select curved and twisted boughs to fit particular places, and skill in this often leads to success and is a great pleasure to one having a taste for it. Observatories can often be built about old trees to advantage. Well curbs and spring houses, bridges, boathouses and landing stages, trellises, arbors, pigeon houses, and shelters for other fancy poultry, are good subjects for rustic work, but a summerhouse with the upper part fitted for English sparrows will soon become so untidy as to unfit it for other use. Success with one attempt at rustic work often induces people to continue their efforts too long and overdo it. Study the fitness of the object for the situation. Put nothing in unless of apparent use or comfort, and then think out a well-proportioned ornamental form. Make comfort beautiful.

FIG. 4. SUMMER HOUSE AT LAKE MOHONK.

Do not place seats on an open lawn because they make a show; no one wants to sit in the hot sun. Under the shade of a tree they are often better than the most elaborate structures. Make them comfortable, and to this end have the back of the seats a little lower than the front, of different heights and widths, with small ones for children. Use no paint or varnish, under any circumstances. If the bark loosens, strip it off and let the bare wood take the color nature gives it. Do not nail on knots and curious pieces of wood. Let the construction show, and avoid excessive elaboration, else our friends will think we might have spent our money and efforts to better purpose than building mere ornament.

STACKING HAY AND GRAIN.

JOHN M. STAHL, ILLINOIS.

A good stack must have a level foundation of poles, fence rails, or other material strong enough to keep the stack off the ground. The poles should be notched slightly, to prevent rolling. I lay down three large rails, or poles, ten feet long, four feet apart. Across these are laid rails, or poles, ten feet long, eighteen inches apart. Across each end of these is laid a stout pole, or rail, and the foundation is completed for a sound stack. For a twenty-foot rick, the foundation is made the same width, but twice as long. A grain stack should be started about ten feet wide, a haystack not more than nine feet wide. The stack will surely spread out as it settles—oats more than wheat, and hay more than oats. If the stack is started as wide as it should be when done, it will be too wide when completed. It should be built up perpendicularly for the first three feet. When so built it will, of itself, bulge enough. If the stack is bulged from the start, it will spread out until it is bulged too much below. A good stack has bulged sides. As the stack is being built, the bulge should be made only about two-thirds as great as is desired when the stack is completed. The stack will spread out somewhat as weight is put upon it, increasing the bulge. It will be yet further increased by the settling of the stack, which will shorten the height, but not the breadth, of the bulged part. Sometimes hay or oats are so slippery that if each course is laid square above the preceding course until the top is drawn in, the stack will be spread enough.

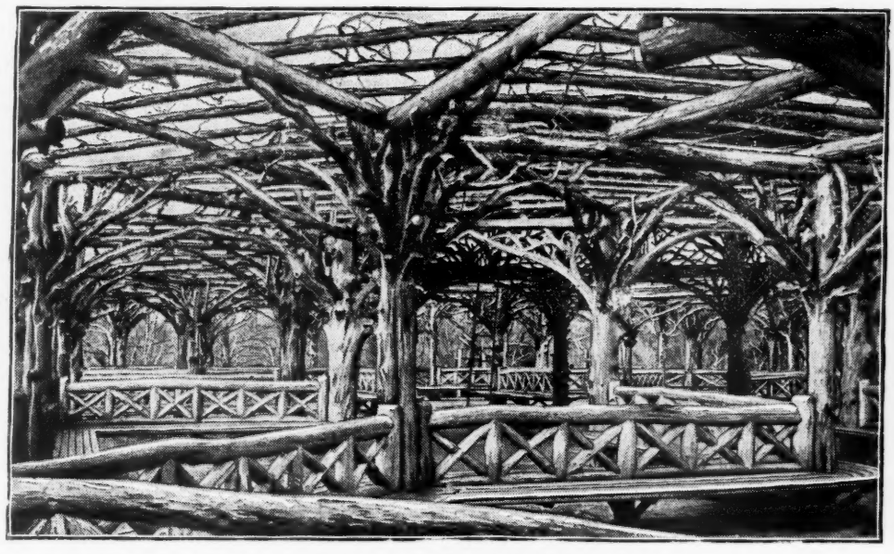


FIG. 6. A LARGE RUSTIC ARBOR.

The greatest secret of building a good stack is keeping the center high and full for grain, and well tramped for hay. The center will settle the most, as there is the greatest weight upon it; hence, if the stack is kept level, or the center only a little the higher while building, when the stack has settled, the center will be the lower; the culms will slope in, not out, and the rain will be carried into the very heart of the stack, spoiling it from top to bottom. The stacker should not go near the edge, but do all the tramping in the middle. Should the edge spread or slip out, put stout props under the offending part, drawing it up close under the stack, so that the slipping portions will be lifted up until they are level. After the stack has settled, the props can be removed.

FIG. 5. RUSTIC UMBRELLA.

To build a first-class stack, one must be careful how he lays the hay or grain in the outside courses. As sheaves are inclined in the shock, the butts are not square when they come to the stack. One must lay the sheaf in such position that the butt will conform to the inclination of the stack. Suppose, for example, that above the bulge a sheaf is so laid that the portion of its butt that projects farthest is uppermost, a pocket is thus formed to catch the rain and hold it until it slowly sinks into the stack, whereas, this pocket would not be formed were the sheaf turned upside down. The bunches of hay that make the outside courses, should be straightened out, for twisted wisps or bunches lying parallel with the surface of the stack will form pockets in which the rain will be collected and held. If the hay is straightened out, the surface of the stack will be smooth. When the stack is completed, it should be raked down, but only lightly.

Many a stack, otherwise good, is spoiled by carelessness in topping. Fine, straight hay should be used for the top. Clover does not shed water well, and should never be placed on the top of a stack. As the last three or four loads are brought to the grain stack, the capsheaves should be laid aside to be used in topping; they will fit closer and make a better top than other sheaves. It is well to retop haystacks when partially settled. Stakes driven into the stack are objectionable keepers, as the rain is apt to follow them into the stack, and they flatten the top to receive rain. The best keepers are sticks, in pairs, connected by about two feet of binder twine, or other stout cord, and hung over the top. The pieces forming each pair should be of about the same weight, else the top will be pulled to one side. If exposed to heavy winds, the top can be secured by long pieces of fence wire tied to stakes or to large stones which swing clear of the sides of the stack. More costly canvas or board covers are sometimes used to roof the stack.

Keep the Chinch Bugs From the Cornfield.—As the wheat and other small grain ripens, their sap dries, cutting off the food supply of the chinch bugs, which thereupon often migrate to the juicy stalks of the cornfield. This migration can be prevented by plowing a strip some rods wide between the small grain and the corn, as the chinch bugs are loath to cross land devoid of vegetation.

GROWTH OF POTATOES.

J. J. WILLIS, SUPERINTENDENT OF SIR J. B. LAWES' EXPERIMENTS, ROTHAMSTED, ENGLAND.

The Rothamsted experiments on the growth of potatoes for fifteen years (1876-1891) on the same ground, disclose some interesting facts regarding the effects of various fertilizers on this plant which, from an agriculturist's point of view, may be regarded as a root crop. The following summary shows the manures and average yearly produce of potatoes per acre through twelve years' experiments.

Description of Manure.	*Marketable.*	*Small.*	*Diseased.*	*Total Tubers.*	*Dis'd in Tot'l*
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Per Ct.*
Unmanured	3,752	560	140	4,452	3.15
Superphosphate	7,280	630	308	8,218	3.66
Mineral manure	7,588	546	294	8,428	3.45
Ammonium salts	4,228	686	210	5,124	4.06
Nitrate of soda	4,998	588	294	5,880	4.93
Minerals and ammonium salts	13,314	812	938	15,064	6.26
Minerals and nitrate of soda	13,146	714	1,036	14,896	7.00

We see that the average produce during this period under the most exhausting treatment, that is, without any manure whatever, was 4,452 pounds per acre, nearly as much as the average produce under ordinary cultivation in the United States, and about two-thirds as much as in some important European countries.

By superphosphate of lime alone the produce is raised from an average of 4,452 pounds to 8,218 pounds; and by a mineral manure containing, besides superphosphate, salts of potash, soda and magnesia, to 8,428 pounds, that is to very little more than by the superphosphate alone. It is evident, therefore, that up to this amount of production, the character of the exhaustion, induced by the growth of the crop on this land, which was, agriculturally speaking, in a somewhat exhausted condition, was much more that of available phosphoric acid than of potash, or the other bases. In reference to this increase of potato tubers by mineral manures alone, it may be observed that the result is quite consistent with that obtained with root crops, having comparatively shallow root development; and in such cases the source of the nitrogen is chiefly the store of it in the surface soil. The beneficial effects of mineral manures, and especially of phosphates, are, indeed, observed generally with ripened, as well as with succulent, crops, which are spring sown, and which have, with a short period of growth, comparatively superficial rooting, and which rely, therefore, much on the stores of the surface soil.

It is remarkable that there is much less increase of produce of potatoes by nitrogenous manures alone than by mineral manures alone. Thus, by ammonium salts alone there is an average produce of 5,124 pounds, or only 672 pounds more than without manure; and with nitrate of soda alone there is an average of only 5,880 pounds per acre. The better result by nitrate of soda than by ammonium salts is doubtlesss due to the nitrogenous supply being more immediately available, and more rapidly distributed within the soil, and so inducing a more extended development of feeding root. These negative results, by the nitrogenous manures alone, confirm the conclusion that by the continuous growth of the crop on this land it was the available supply of mineral constituents within the root range of the plant, more than that of nitrogen, that became deficient.

The amount of produce obtained by the mixture of both mineral and nitrogenous manures are sufficient to show that, although the land is by no means specially adapted for potatoes, the results may be taken as normal and trustworthy; and as fairly indicating the characteristic manurial requirements of the crop; and the conclusion is that, in an agriculturally exhausted soil, both mineral and nitrogenous manures are required to give full crops of tubers.

With an annual application of sixteen tons of barnyard manure per acre, supplying about 200 pounds of nitrogen per acre per annum, there was an average produce of only 11,760 pounds; the addition of superphosphate of lime raised the produce to 12,540 pounds. But by the further addition of nitrate of soda, supplying eighty-six pounds of nitrogen per acre per annum in a much more readily available condition than most of that in the barnyard manure, the average annual produce of tubers was raised to 16,904 pounds, or by 3,360 pounds more.

Comparing these results with those obtained by artificial manures alone, we find that barnyard manure, which, besides an abundance of mineral matters and a large amount of organic substance, rich in carbon, supplied annually about 200 pounds of nitrogen, gave considerable less produce than an artificial mixture of mineral manures and ammonium salts, or nitrate of soda, supplying only eighty-six pounds of nitrogen per acre per annum. The fact is, that it is only the comparatively small proportion of the nitrogen of barnyard manure which is due to the liquid dejections of the animals, that is in a readily and rapidly available condition; while that due to the more or less digested matter passing in the fæces, is more slowly available, and that in the litter remains a very long time inactive. Hence, the addition of nitrogen as nitrate of soda to the barnyard manure had a very marked effect.

The last column in the table shows the average percentage of diseased tubers under each condition of manuring. It is seen that without manure, and with purely mineral manures, the proportion of diseased tubers is much less than where nitrogenous manures were applied; and again, that it was less where the nitrogenous ingredients were applied alone, than when in conjunction with mineral manures; and where, consequently, the luxuriance of growth, and the amounts of produce, were the greatest. The experiments further show that the potato disease, though largely dependent on season, developed much more in tubers grown by highly nitrogenous manures, and containing a juice rich in nitrogen, than under ordinary conditions. It is also shown that a result of the disease is a destruction of starch, the formation of sugar, the loss of organic substance, and the growth of the fungus at the expense of the material of the tuber.

RESULTS OF ROTHAMSTED POTATO EXPERIMENTS. — 1. The amount of disease was not enhanced by the continuous growth of potatoes on the same ground. 2. The disease was increased by fertilizers rich in available nitrogen. 3. The disease changed much potato starch into sugar, and the fungus fed at the expense of the tuber. 4. The continuous growth of potatoes on the same land did not so much exhaust the available nitrogen as it did the supply of mineral constituents within the reach of the roots. 5. In a wornout soil, both mineral and nitrogenous fertilizers are required to give full crops of potatoes.

THE MELTING POINT OF BUTTER.

A. L. WINTON, JR., CONNECTICUT EXPERIMENT STATION.

For years Danish butter has commanded a higher price in the English market than butter from Friesland, the leading dairy province of Holland, because it does not soften so easily in warm weather—a quality of greater importance in English manufacturing cities than delicacy of flavor. All attempts to ascertain the reason for this difference in the butter from the two countries were unsuccessful until 1888 when Prof. Adolf Mayer of Holland proved that it was due to the difference in feeding. In Denmark the cows are stall fed during the greater part of the year, on a ration of hay or straw with oil cake; while in Holland pasturage is the chief dependence. Mayer found that the melting point of the butter fat from a cow fed on hay and oil cake was eight to twelve degrees Fahrenheit higher than that from the same cow after she had been turned out to pasture. Further experiments showed that feeding with green fodder, whether from grasses or legumes, beets, and probably all fodders rich in sugars and other soluble carbohydrates produced a much easier melting butter-fat containing a larger proportion of volatile fatty acids and olein, than feeding with hay, straw and ensilage. In other words, summer feeding, as usually practiced, makes easier melting butter than winter feeding, although the reverse state of affairs would be much more desirable.

Recently Mayer has studied the effect of feeding cane sugar on the constitution and properties of the butter. He reasoned that if fodder rich in sugars make butter with a low melting point then sugar added to a ration ought to bring about the same result. A cow seven months in milk was allowed, during three feeding periods of ten days each, a ration consisting of seventy pounds of the residue from beet-sugar manufacture, eleven pounds of rye straw, and nine pounds of oil cake. During the second period she was given, in addition to this ration, four pounds of cane sugar. Examination of the butter-fat showed that the melting point, which during the first period was 92° F. was depressed during the second period, when sugar was fed, to 86°F. but rose again during the last period to 89° F. As was the case in previous experiments the easier melting butter was richest in volatile fatty acids and olein.

Sell Farm Stock Young.—Farm stock is often kept too long for profit. Sheep decline very rapidly after six years old, and are best sold at five. Cows may retain their usefulness until twelve. Cattle and sheep are sold for meat, but with horses it is different. A horse that has been a good and faithful servant for many years is often kept until he dies, which is better than selling him for a mere pittance, to be abused the remainder of his life. A good rule to follow is to dispose of farm stock at or previous to their prime of life.

SALTING SHEEP.

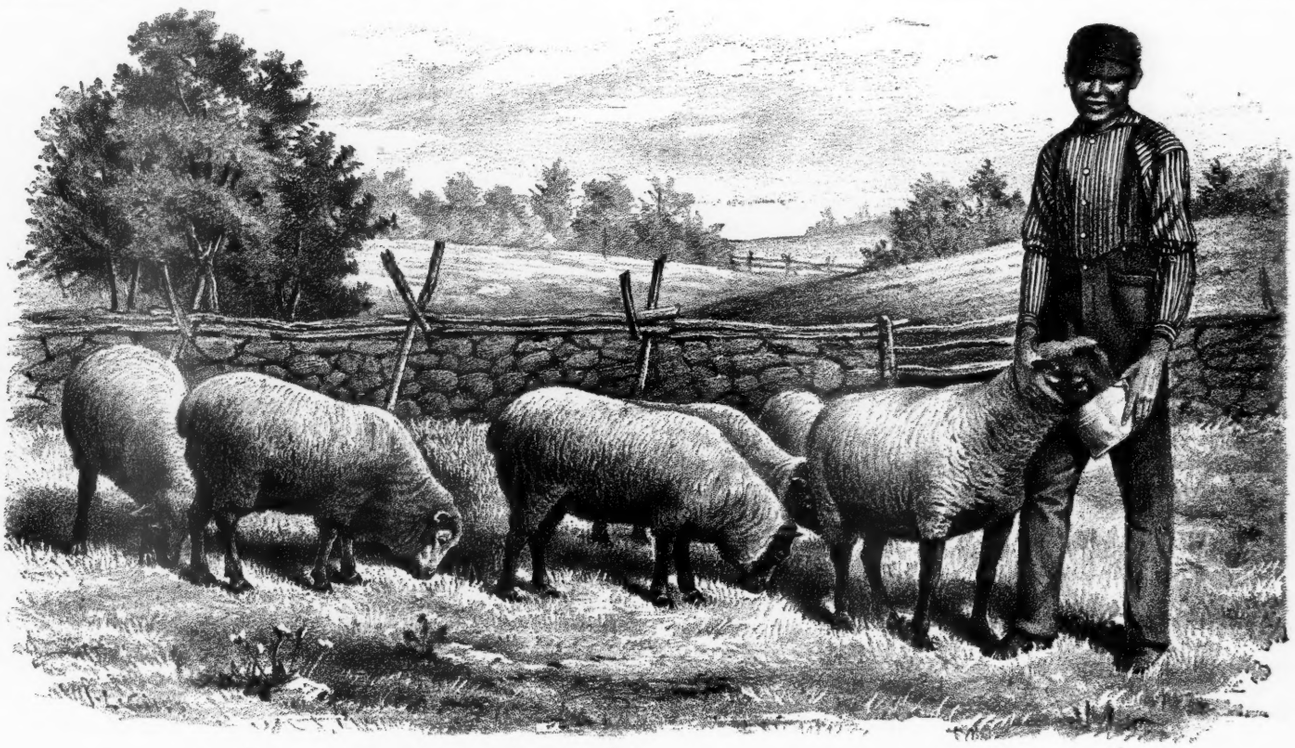
J. S. WOODWARD.

Some modern theorists hold that salt is not only unnecessary, but positively injurious to all animals, not excluding man. They assert that the fact that salt is found in the blood and tissues of all animals, and that it exudes through the pores, is no evidence of its necessity to the animal, but simply shows that it has been taken with the food into the stomach, and so has passed into the various parts of the system, taking the perspiration as one of the means of exit. The intense craving of all animals for salt, and the fact that in the wild state animals travel many miles to obtain it, furnishes sufficient proof that it is necessary for their health, rather than that it is an accidental part of their food, and that the craving for it is wholly an acquired taste. That salt eaten in immoderate quantities, and after long intervals, has been followed by bad results does not prove it harmful any more than the bad results following a too heavy feed of oats, after a prolonged fast, proves that oats are unwholesome. Both are good, but must be used properly. Certain it is, as has been proved by carefully made and often repeated experiments, that animals with a liberal supply of salt, judiciously given, do better than those deprived of its use. No animal has a greater craving for salt than sheep, and to no other is it more important. That they can live wholly without salt no one doubts, but it is just as evident that they thrive better when it is often and regularly given to them. In districts where sheep are subject to fluke or liver rot, an abundant supply of salt is said to be a preventive. To keep a quantity of salt under cover in the field, where the sheep can eat it when so disposed, is a safe way of supplying it, and may be followed without fear of injury, as no animal will eat salt enough to be harmful when it has a supply constantly at hand.

It is very desirable that sheep should be kept so tame as to be easily caught and handled, and the weekly salting is a powerful aid in making the sheep docile. The salt may be dropped, in small handfuls, on the sod, or put into small boxes kept in the field. If the salt is dropped on obstinate weeds, or tuft of coarse grass, the sheep will eradicate them, and better herbage will take the place. With a little time spent each week in letting the sheep eat from the hand, or the dish, the whole flock can be kept very tame, and the time will be amply repaid whenever it is necessary to move the sheep to other pastures, or to catch any for other purposes.

I once went with a farmer to see his sheep in a far-off hillside pasture; he called them as loudly as he could, without being able to induce them to come. I said ironically, "Your sheep see you so often that they don't seem to care much about you; it is another instance proving that 'familiarity breeds contempt.'" "Why sir," the farmer replied, "I have not once seen these sheep, even to salt them, in three months." Upon closer inspection, it appeared that what he said was true. Had their owner seen them oftener, and given them more salt and care, they would have looked much better, and would not have been so wild.

In contrast to this, when among the flocks in England, I was much struck with the tameness of the sheep, and the ease with which the shepherd caught any sheep of the flock. As a rule, the shepherd is with the flock, more or less, every day, and he never goes among them empty-handed; he either has salt, or something else of which they are fond. What sight can be more beautiful than to see the shepherd afield with the whole flock crowding about him, sleek and fat, willing to be petted that they may get a taste from his hand of the palatable salt. What a scene of contentment and loveliness is depicted in the accompanying engraving, drawn from nature. The whole landscape is full of beauty; the sheep, round and smooth, nibbling the grass on which the salt has been dropped, and the boy with his pet "mamie" eating from the dish. It is difficult to tell which is the most contented and happy of the lot. To judge from the expression of the boy's face and that of his pet, the enjoyment of the petting is mutual. This picture only lacks the songs of the birds to make it perfect. What a pity this cannot be reproduced in type and printers' ink.



FEEDING SALT TO HIS PET MAMIE.

Locate Near a Market.—This applies more particularly to those who intend engaging in market gardening, or small-fruit culture. For catering for the markets of cities of from fifty to several hundred thousand population, the fruit and vegetable gardens should be located not more than an hour's drive from town, or not to exceed five miles from the corporation line. Most cities have suburban towns, a few miles away, upon each side, and land can be bought cheaper near the cities than in these villages, with the chances that the location nearest the city will prove the most desirable to cut up into lots when it becomes too valuable for trucking. Near the larger place are, usually, better educational facilities, churches, etc. Trucking is heavy work, and every mile farther away from market is a loss of time, in the wear and tear of vehicles and horses, of at least ten dollars per acre per year. For a good investment, other things being equal, it is better to pay fifty dollars more per acre for land three miles from the corporation than for the same space four miles away. Usually there is not that difference asked, but for the business named more than that amount actually exists in extra expense.

BUTTER AND BUTTER PACKAGES IN THE NEW YORK MARKET.

V. CRAWFORD.

Popular taste is changing in regard to butter. No longer does the June product fill the entire bill for fall and winter use. Good butter is always salable at a fair price, but the highest prices are obtained for that which is freshly made and carried from the producer to the consumer as rapidly as possible. This has a peculiar flavor, highly relished by most people, which very rapidly deteriorates. Butter for immediate consumption usually contains less salt than that which is to be kept for some time, and is put up in smaller packages. Many farmers are tempted to disbelieve the statement that butter is sold for eighty cents to one dollar per pound; but tons of it are sold at those prices at retail, not only in New York but in other large cities. The number of people who will pay that price for butter is, however, like the class who will make it, limited. A great deal of the high-priced butter sold in New York comes from the Darlington creamery, Philadelphia, and all of it is made by hand. I know of private dairies of only a few cows that follow the primitive methods, yet receive from private customers one dollar per pound for their product. Call it prejudice if you will, but a great many people believe that good butter can be made in no other way, and are ready to back up their belief with a good, round price for that made as mother used to make it in boyhood days, back on the old farm among the hills.

This high-priced butter is all in pound or half-pound prints, ornamented with fanciful designs, and packed in convenient carriers. Small packages are not in favor with general dealers. These fancy qualities must have a special market. A small package, that is very convenient with a certain trade, has lately made its appearance. It is simply a round box containing five pounds, with a tight-fitting cover, made of some patent material, intended to be impervious to air and brine. These boxes are packed in crates, and are sold without any removal or division of the contents. Tin and tin-lined packages, holding from ten to twenty-five or thirty pounds, are plentiful, but are not popular except with a small class; they are usually sold for a little less per pound than firkins. The chief argument for these smaller packages, especially for smaller dairies, is that they are more quickly filled. It is desirable, always, that a package should be filled at a single churning. Small, hard-wood pails, neatly painted, are used by some adjacent dairies, and are returned after being emptied. The favorite packages for storage or export are hard-wood firkins, holding fifty or one hundred pounds. Soft wood should never be used for firkins, as it imparts a bad flavor to the butter. Before shipping, the top of the butter should be covered with dry salt, and it should never be allowed to come in contact with the cover.

SUMMER MANAGEMENT OF COWS.

L. D. SNOOK, NEW YORK.

In mixed farming, the cow plays an important part, and upon her management depends, in a great measure, the amount of product in the form of butter or cheese. It is presupposed that the cows are good ones, speaking in the general acceptance of the term. The next point is to provide good pasturage, not clover alone, yet the result may be quite satisfactory if it is red clover. But pastures of white clover, or alsike, have been condemned by observing butter makers as rendering the cream produced difficult to convert into butter. In its growing state there is more flesh and milk producing elements in a pound of timothy than in a pound of clover, and the former is more the natural food of the domestic animals than is the latter.

Fresh, pure water is another very important requirement. While cows will, and do, drink stagnant water with apparent relish, yet too often it is a matter of compulsion. At all times, and more especially in warm weather, they should have free access to water, and not wait for the attendant to pump it night and morning. During the heated term, they may be observed going to the creek several times a day, and no domestic animal will drink a greater quantity of water than a milch cow. During July, August and September, when flies are troublesome, cows should not be kept in a dry, open yard at night. During the heat of the day, they spend a large portion of their time in the shade, or are so tormented by flies that they do not eat as much food as they need. If the cow pasture is visited any moonlight night following a hot day, the herd will be found busily eating often until near midnight. This means an increased flow of milk. Another important matter concerning this night pasturage is the more even distribution of the excrement, the liquid portion of which is all certainly lost if they are confined in a yard during the night. If they are kept from eight in the morning until four in the afternoon, during hot days, in a darkened stable, with a supply of green succulent food at noon, it would be better than yarding at night. This will cause more work, but it will pay well in the increased production of milk.

Salting is another important matter. The true way is to have a supply of salt before them at all times. If barrel salt is used, it may be placed in a box in the pasture and covered to keep out the rain. Better yet is to place a piece of rock salt at some place in the pasture, where they may obtain a supply by licking it off as they may need, and not be obliged to eat it as they do when given them in a finer state and at unequal intervals, or when you happen to think of it, as practiced by nearly all farmers.

Change of pasture, as frequently as every two weeks, is important. Any pasture becomes badly contaminated by the feet of the cattle, and the droppings and the herbage is not inviting for the stock to nibble at. When the pasture is in this condition they travel over the entire area every day to find some inviting place to feed. Instead of giving cows the range of two or three fields at once, confine them in one, even if you change them every two or three days.

Do not pasture sheep or horses with them, for reasons not necessary to here enumerate. See strictly to it that the cows are quietly driven to and from the pasture. Have regular hours for milking, and try and divide the time into twelve hours each, especially in June, when the production of milk is the greatest. Treat them kindly, and in such a manner that they will come at the calling. If you send a dog for them, don't allow him to chase or bite them. Don't tell stories or talk while milking, but attend to it quietly and rapidly.

OAT STRAW WITH CORN FODDER.

E. ROCKWOOD, MICHIGAN.

Our supply of corn fodder seemed amply sufficient last fall, but it began to run low before spring, and as an experiment oat straw, after being run through the feed cutter, was fed with cut corn fodder. This was mixed half-and-half, using no more of this mixture than had been given of corn fodder alone. The whole was moistened and well mixed with the corn and cob meal, ground oats and wheat bran, which constituted the grain ration. There was no falling off in the quantity of either milk or butter while on this feed. It proved to be a valuable experiment, oat straw being plentiful, while the corn fodder could not be bought, and hay was very high. Had the cut straw alone been fed with the grain, the result might have been a diminished milk yield—an experiment we did not care to try. It is much easier to reduce the quantity of milk than to increase it again. Milch cows are very like a thermometer in their sensitiveness to changes, except that they go down much more quickly than they go up.

Tidy up the Farm.—In traveling through the country, when a tidy-looking farm is passed, with fences in good order, buildings looking neat and trim, trees trimmed and clean, we know the resident is a person who takes pride and interest in his farming, and that it pays him to do it. It takes but a few days each year to keep the brush cut away from the fences, to nail up a board here and there that may have become loosened, to keep the fences up straight, with no weak places to tempt stock to press through into the owner's or neighbors' fields of grain or grass, to put the implements under shelter when not in use, to pick up boards lying about the barn and house, to trim the fruit trees and cut out all dead or dying branches, to mow the lawn at least once each year, to arrange all gates so that they will freely swing on their hinges, to have a well-kept garden, a good supply of small fruit, the pump in good working order, a good supply of dry wood under shelter, to keep the roadsides mowed and bushes cut down, to keep the outlet of expensive underdrains open, to clean out all open ditches, to look after the stock frequently. All these things take but a little time, and they increase the cash value of the farm. If you have, in the past, neglected these things, resolve that you will reform, and that strangers, in passing your door, may at least mentally say, "A good farmer resides there!" Possibly it will not allow as many leisure hours at the corner grocery, but others will take your place there, and you are adding to the worth of your earthly possessions, and to your standing as a man.

SUMMER PLANTING OF STRAWBERRIES.

The usual method of making a strawberry bed, is to set out the plants in the spring in rows three feet apart for the field, eighteen inches for the garden, and fifteen to eighteen inches apart in the row. The plants are well cultivated during the summer, the runners

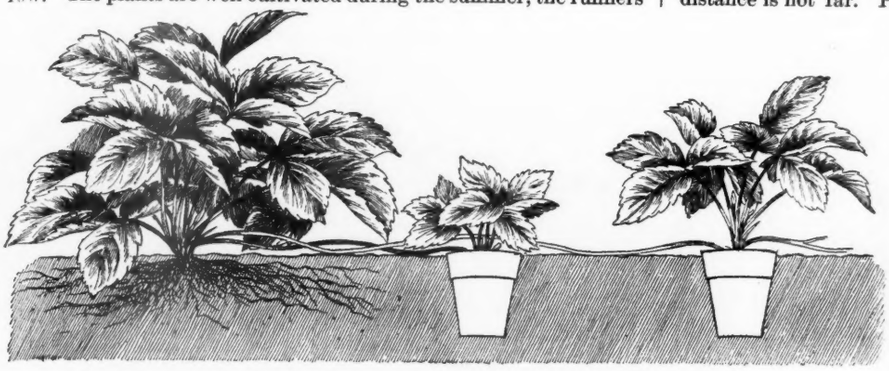


FIG. 1. YOUNG STRAWBERRY PLANTS LAYERED IN POTS.

trained into rows, or trimmed back, as the matted row, or hill system, is desired. The greater yield undoubtedly comes from the matted-row system, while the biggest berries are produced on plants

FIG. 2. POT-GROWN STRAWBERRY PLANT.

from which all runners have been cut or pinched off. Many persons are so situated that they cannot set out a bed in the spring, but would like a crop of strawberries, without waiting nearly two years. Or again, the land may be occupied by an early crop that can be taken off in July or August. To such, and to those who wish to propagate a new and valuable variety, the method of using potted plants, for setting in midsummer, is available. Select a bed, planted in the spring, to secure the young plants from. Procure two and one-half-inch pots, which may be bought for about five dollars per thousand, and, where the runner forms a joint, plunge one of these pots in the earth up to the rim. Fill it with soil, place the runner so it will root in the pot and hold it down by covering with a little soil or a small stone, as shown in Fig. 1. The runner will keep on growing, and three or four plants may often be obtained from one runner.

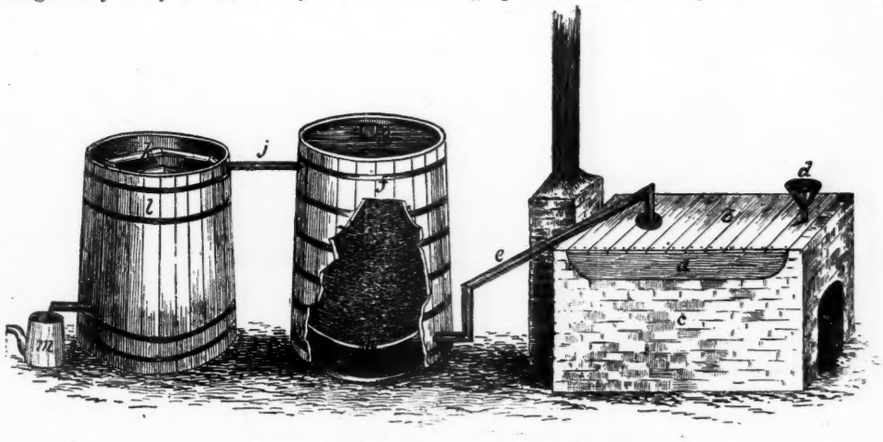
After the young plants are well rooted they should be severed from the parent plant and may be left to grow in the pot until wanted to set in the bed. This, however, should be done before they become too much pot-bound. Prepare the bed in the best possible manner, taking pains to thoroughly pulverize the soil and enrich it with good, well-decomposed yard manure. Green manure is not so good, because it contains so many weed seeds. Choose a cloudy or rainy day for transplanting, or one just before a rain, if possible. Have a boy to lift the pots, carry and distribute them along the rows, if the distance is not far. Pick up the pot in your right hand, place the left over the top, with the plant between the middle fingers, give the edge a slight rap, and the plant and ball of earth will come out entire, presenting an appearance as seen in Fig. 2. With the right hand, or a trowel, scoop a hole in the ground, turn in the plant, and press the earth firmly around the ball, setting the plant a little deeper than it was in the pot, but not so much as to cover its crown. It takes but an instant to do this, and a good, smart man should set three thousand in a day of ten hours, if they are right at his hand. Those who cannot conveniently pot the plants can buy potted plants of almost any nurseryman. Plants set out by, or before, the middle of August should obtain a good growth and bear a profitable crop the next summer. The one disadvantage of this method, is the liability of a dry spell about the time the transplanting occurs, and the loss of the plants in this way. Still it is well worth a trial and the chances are more than even that a good stand of plants will be secured. Where there are crops of early potatoes, peas, beans, or other garden vegetables, on the ground, they can usually be taken off in time to set the strawberry plants. Then, if it should be desirable, after they have borne the next year, the plants may be plowed under and the land planted to a late crop of some garden vegetable, thus producing three paying crops in two years. In most cases, however, it will pay to leave the bed another year for a second crop.

THE GROWTH AND MANUFACTURE OF PEPPERMINT.

J. B. ELLIS.

The cultivation of Peppermint and its distillation for essential oil may be made a source of profit in many sections. A suitable piece of rather moist ground should be selected, as the plant naturally grows along rivulets, on springy hillsides, or in wet pastures. The soil must be dry enough to admit of thorough cultivation. The field chosen should be put into some cultivated crop, corn or potatoes, before planting the Peppermint, so as to have it mellow and clear of weeds. As soon as the ground is fit to work in the spring it should be plowed, harrowed and marked out with furrows eighteen inches apart.

If there is no field of cultivated Peppermint accessible, the roots may be dug from some place where the plant grows naturally. They are then laid in the furrows prepared for them so as to form a continuous line of roots, and then covered lightly with earth. If wild roots are used, it will not be easy to get enough the first year, to set a large patch, but when a plantation has been

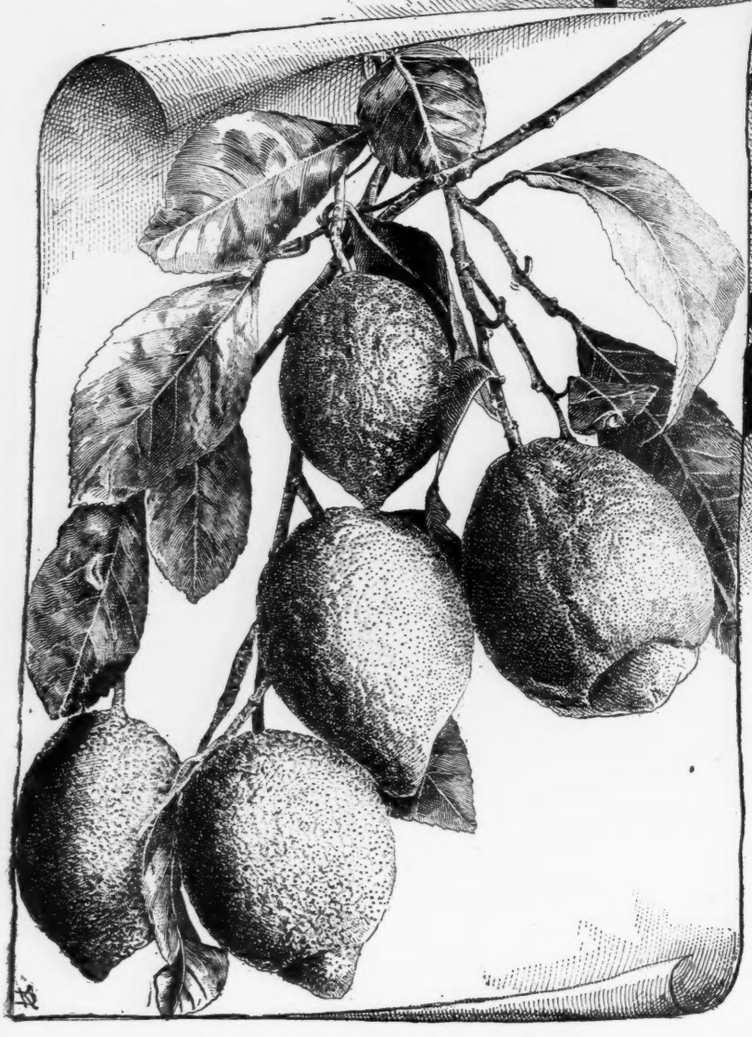


APPARATUS FOR DISTILLING PEPPERMINT OIL.

once established, three or four square rods of ground will furnish roots enough to plant an acre. An expeditious mode of planting roots is to put a bushel, or more, of them into a large sack which is

slung over the left shoulder so that the setter can take out a handful of roots with his right hand and throw them into the furrow before him, covering them by pushing in the soil with the inside of his foot, first one foot and then the other, as he goes along. In this way an experienced hand will plant an acre in a day.

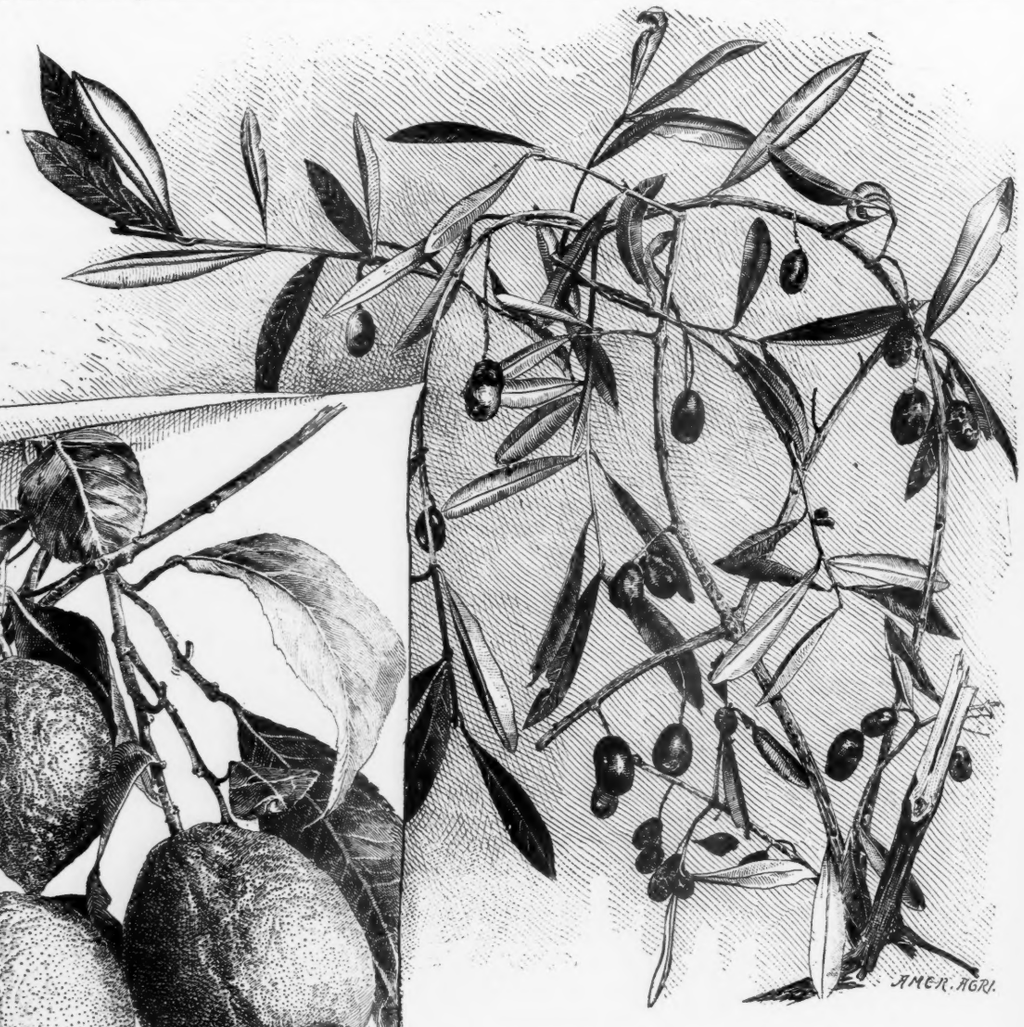
Soon after planting, the young shoots will begin to appear, and as soon as they are well above the ground, a narrow, fine-toothed cultivator is run between the rows, care being taken not to cover the young plants more than is necessary. The cultivation must be kept up at intervals till August when the mint will be in full blossom and ready to cut, which is done with a scythe or cradle. After cutting, the runners from the rows so cover the ground that the next year no cultivation can be given. The second year gives the greatest yield. Thereafter weeds get in so that after the third year the field has to be plowed up and reset, or put into some other crop. To save time when work is crowding in the spring, the roots may be dug in the fall and "heeled in." In this way they will keep perfectly well through the winter and be ready when wanted for planting.



BRANCH OF FRENCH LEMONS.

The process of distillation consists in sending hot steam through the mint and thus vaporizing the oil which is carried with the steam and with it condensed in the worm of the still, from which both run together in a steady stream into the "separator," a tin vessel like a coffee-pot, the spout rising from near the bottom to about an inch below the top (as shown in the engraving on the preceding page). The oil and water run into the separator mixed together, but the water, being heavier, sinks to the bottom of the vessel until this is filled up to the level of the upper end of the spout, from which it then continues to run; while the oil, being lighter, floats on the surface of the water in the separator from which it may be dipped off, from time to time, with a tin dipper.

For generating steam a common steam boiler will answer. A homemade boiler may be used with equally good results. This is made as follows: Two pieces of two-inch plank, *a*, four feet long by six inches wide, are rounded at the ends. A piece of good sheet iron about six feet long and three feet wide, is securely nailed around the ends of the planks, making a square-ended flat boat. The top of this boiler is covered with matched boards, *b*, securely nailed down, two holes being bored through the boards, one to admit water into the boiler, through a funnel *d*, and the other for the pipe, *e*, that carries the steam to the tub of mint. This boiler is placed on a stone or brick arch *c* so that a fire can be made under it.

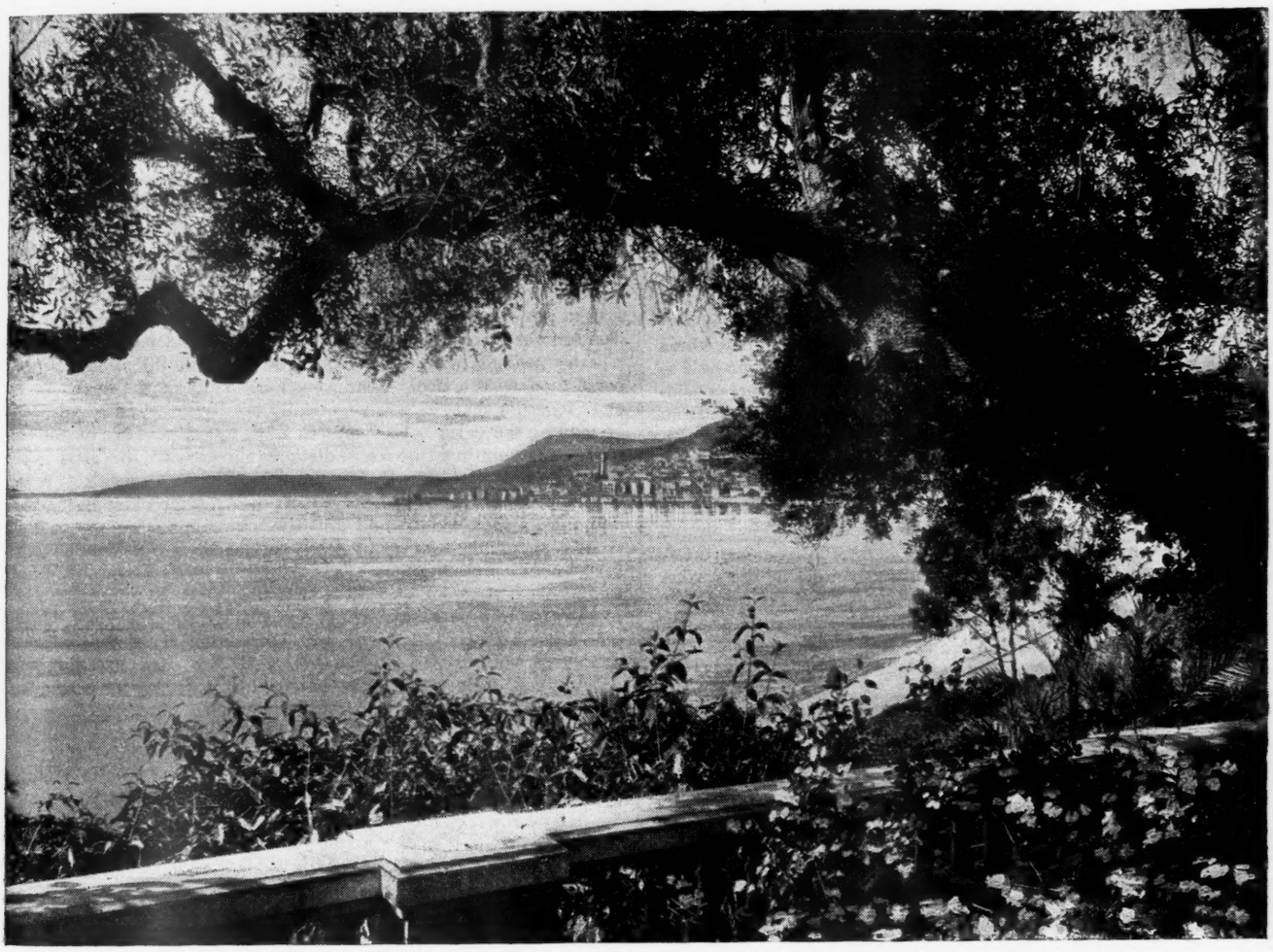


OLIVES OF SOUTHERN FRANCE.

With a boiler of the size described, the tub *f*, for holding the mint, should be about three feet across and four feet high, with a close-fitting lid *g*, hinged on at the top. This lid when closed may be luted up with clay. In the lower part of the tub is placed a false bottom, *h*, pierced with numerous auger holes and raised about two inches from the real bottom. The steam from the boiler comes in below this false bottom and, diffusing itself through the two-inch space, rises evenly through the mass of mint *i*, which is packed into the tub as close as possible, by pressing and treading till the tub is filled. From the side of the tub, as close to the top as possible, issues the tube *j*, through which the steam and vaporized oil escape to the "worm" for condensation.

The worm *k*, stands in another tub *l*, or in a molasses hogshead which is kept filled with cold water, either pumped from a well, or flowing in from some stream or spring at a higher level.

A copper worm is expensive. Tin answers just as well and can be made by any tinsmith. The cost of a tin worm sixty-five feet long and one and one-half inches in diameter is about $13. If of tin, the worm should be built into four upright pieces of board, *m*, about four feet long and six inches wide, standing upright and with their outer edges notched to receive and hold the tube in its place The apparatus described is essentially the same as that used around St. Joseph, Mich., where Peppermint is raised and distilled extensively. The cost of all the apparatus described above will not exceed $25. Where water can be had at a higher level, the worm may be dispensed with, using instead a straight tube lying in a long trough slightly inclined. A stream of water running through this trough keeps the tube cool and condenses the steam. Other plants besides Peppermint may be distilled with the apparatus here described. Horsemint, Wormwood, Sassafras, Sage, and other essential oils are thus made. The cost of raising an acre of Peppermint is about the same as for an acre of corn. The yield will be from ten to twenty pounds per acre. The advantage in raising this crop is that it does not exhaust the ground like the cereal crops and grows in wet ground that would be of but little value for ordinary farm crops.



VIEW OF MENTONE ON THE MEDITERRANEAN SEA.

FRUITS AND VEGETABLES IN MENTONE.

F. C. CHAPPELL, FRANCE.

Mentone is best known as one of the most celebrated health resorts in France. Comparatively few of the thousands of visitors who annually stay there know anything about the fruit and vegetable culture carried on in and about the town. The olive is one of the most important articles of production. In Mentone the olives are grown upon umbrageous tress, which grow almost as high as small oaks, producing an excellent and abundant oil, from small dark berries. But these natural advantages are minimized by the obsolete styles of crushing mills, worked by water, in which really no improvement has been made since the early Roman days. Under these circumstances it is not surprising that a considerable quantity of the oil is wasted, while the cost of production is high. In Florence, Italy, it may be stated, the very same quality of berry is made to produce a superior oil, which, of course, commands a better price in foreign markets. The Florentine mills are worked by an English company, which pays a good dividend to its shareholders A rival to olive oil has been found in petroleum; and in Messina, Italy, olives have gone down in price since the above-named oil came into use for lamps, to the extent of one hundred per cent.—a bushel of olives selling for about sixty cents.

Lemons are also cultivated in Mentone, the average lemon crop being estimated at about seventy tons per year. The soil is especially adapted to this culture, the country round about the town producing an excellent quality of lemon. Last season, prices were three dollars per one thousand. The production of this fruit could be readily extended, as the native willingly betakes himself to its cultivation, as being one with which he is most conversant. It only needs an intelligent system of cultivation to produce strawberries in Mentone, at a very early part of the year, as in certain sites this fruit ripens freely in the open air at Christmas.

Horticulture is, however, very backward, the inhabitants of the town having, for the most part, to obtain even cabbages and onions from Nice and other districts. Native growers neglect market gardening. It has been found by private individuals that English seed potatoes planted at intervals of three weeks, in gardens, produced, by means of irrigation during the dry months, magnificent crops from November until April. For these as well as for many other vegetables and fruits which can be produced here during the winter months excellent markets could be secured in Paris, London, Berlin and other large European cities.

[The illustrations herewith are from photographs specially taken for the AMERICAN AGRICULTURIST, by Messrs. Amarante & Co. Mentone. In Fig. 1 are seen bearing branches of lemons and olives, and Fig. 2 presents a charming view of olive-embowered Mentone on the shores of the Mediterranean Sea.]

OYSTER BAY ASPARAGUS CULTURE.

F. H. VALENTINE.

Oyster Bay is about thirty miles from New York, on the north shore of Long Island, and all the asparagus grown in this vicinity is sold as "Oyster Bay," which name has become a sort of trademark. The first "large" plantation for market purposes, consisting of about one acre, was made a half century or more ago, and the neighbors of the venturesome planter predicted that he would never find a market for such a quantity. To-day a man with only one acre is considered a small grower, while many have a score or more acres, and this is the chief money crop of many farmers of this region. The larger the scale upon which it is grown, the more can advantage be taken of special implements.

The soil of this locality varies from a light sand to a heavy loam. Some growers have a preference for one kind, and some for another; but all agree that the soil must be clean and free from stones, roots, and other obstructions. The freer from weeds, the less the labor of cultivation. A soil naturally fertile or else thoroughly fertilized is essential to the production of the best "grass," though some claim to get a good crop from light sand without any fertilizer. Some use New York horse manure; some utilize the drift along the beach, while others depend upon chemical fertilizers of different brands. No salt is used. Formerly all manuring was done in the spring, but the practice of applying all fertilizers immediately after the cutting is finished is increasing. The reason for this is found in the fact that the new stool of roots which furnishes next season's crop, is thereby enabled to make a stronger growth, and will be thus prepared to throw up larger and more numerous shoots.

Most of the growers raise their own plants. Some use one-year-olds, others like two-year olds better. Conover's Colossal and Barr's Mammoth are the leading varieties grown, though new kinds are tested. In planting, the rows are made three and one-half to four and one-half feet apart, the most experienced growers considering the latter distance close enough. The roots are planted from twelve to eighteen inches deep, the latter depth in lighter soil. Formerly, planting was a tremendous task, as the trenches were all dug by hand, but now special implements have been invented for making these ditches. Previous thorough culture of the soil is desirable, but most planters prefer not to have had the land plowed since the previous spring in order that it may be trenched more easily. Planting is generally, if not always, done in the spring. The plants are put fifteen to eighteen inches apart in the rows.

When horse or stable manure is used it is scattered in the bottom of the trenches, covered slightly with earth, and then the plants are placed upon it with the roots carefully spread out. They are then covered with an inch or two of soil. When chemical fertilizers are used, they are put in above the plants, sometimes directly upon them, sometimes after a little earth has been sprinkled over. No more soil is put on until the plants begin to grow. Some use a cultivator with small or narrow teeth, which is run between the trenches after growth begins, thus gradually filling them as the shoots grow. A homemade implement, called a "hone," which looks something like an exaggerated V with the apex opened a couple of feet, is frequently used. It is drawn, wide end foremost, lengthwise over each row, leaving a narrow bed of mellow soil. In early spring, the asparagus tops are removed, these ridges plowed down, the soil over the plants worked up fine, and the hone again used. Thorough cultivation is necessary. Some fields overrun with weeds were said to belong to men who had more than they could properly care for. It is, perhaps, needless to say that these found no profit in the business.

Cutting usually begins when the shoots are an inch or two above the surface. The beds are gone over every day. A smart man will attend to about two acres. A knife made especially for this purpose is used, and the shoots are cut several inches below the surface. The work is hard, and great care is necessary to prevent injury to the buds which have just started. The bunching is done by women and children. The product is usually shipped to New York, though much of it is canned when the price gets too low to be satisfactory.

It is difficult to get an estimate of the yield; in fact it varies widely with different growers and different methods of culture. It has proved a profitable crop in the past, but asparagus culture has extended, until the Southern States and New Jersey, as well as some other localities, send large quantities to market before the Oyster Bay crop is ready; this precludes the former high prices obtained for the early crop. Then, too, considerable capital is necessary to engage in its culture, as it is usually three years before much cutting is done, and five before a full crop is secured. Thus considerable labor is expended, and several years' interest is added to the expense account before any returns are secured. Some of the growers plow up their beds after twelve or fifteen years' cutting, while others continue them longer. With the best of cultivation and fertilizing, they should last longer, but when the shoots begin to grow small, it is time to plow up, new fields having been started meantime to take the place of the old ones.

SIDEWALKS IN THE COUNTRY.

GEORGE R. KNAPP, NEW JERSEY.

While it is true that nearly all incorporated towns have laws compelling the building of sidewalks, and regulating their width, material, etc., is it not as evident that the necessity for some sidewalk in the country is sufficiently great to warrant the agitation of the subject? I would not, for a moment, advocate any law which would compel the building and maintenance of plank, flag, or even gravel walks in the country, but a well-defined path or sidewalk might be had without injury to any one. It is true that the average pathmaster would be of little use in carrying out a plan of this nature, but certainly it is possible to so construct a law that the parsimonious man can be made to fall in with his more public-spirited fellow-citizens. I remember well a New York farm I worked some years ago which had a frontage of nearly 500 feet on the road. At an expense of less than ten dollars in labor, a path four feet wide was constructed along that whole front. The work consisted simply in marking out, by means of lines, the required width, using an edge cutter to loosen the sod next to the lines, and a horse, with a light plow, to loosen up the earth and sod between the lines; the iron scraper was then brought into play, and the work of making a path was done, with the exception of the trimming up, which was performed with a hoe. Near New York many of the towns are so close together that there is practically no division line which is to be seen by the casual observer. In most cases these are macadamized roads running the whole distance through to the city. Certainly there is nothing which will prevent the path I speak of being constructed at the side of such a road. In some places it is done, and the expense is so small and the improvement so great that, from a pecuniary standpoint solely, it has been considered a good investment. Public spirit is all very well in its place, but we all know that it is possible for three or four close-fisted men in a town to prevent improvements which are plainly for the good of the whole community. Some way of converting these short-sighted people is what we want. Gravel paths are used in Ohio, and coarsely sifted coal ashes make an excellent covering for sidewalks.

PLOWHANDLE PLODDINGS.

JONATHAN HAYSEED.

Some people dress for work, but never work for dress.

High-priced clothes and low-priced cattle will not pay the mortgage on the farm.

A lawyer can raise more off the line fences than the farmer off all the lands between them.

Red hair and freckles may run in the family, but a boy seldom takes drinking and swearing from his mother.

You can find out how much longer your nose is than your arm by hunting for the door in a dark room.

A man may succeed in starving his land and feeding himself pretty well; but it isn't much better than highway robbery.

It's a good rule to subtract a foot from the height of a door, when you wear a plug hat—unless you want to buy a new hat.

"I'm sure," said Old Mr. Shavepaper; "no one could take more interest in lands than I do." "Not legally," retorted his son Tom.

The money a comfortable washhouse would cost, will buy a handsome coffin for the woman who will be economical enough to wash out in the calf pasture.

Don't judge a man's respectability by the quality of the umbrella he carries; he may have had a fit of absent-mindedness in the church vestibule.

A father gave his three sons each a farm. One drank himself to death, using his up; the second died in the poorhouse after trading his away, and the third killed himself by overwork trying to get all three. Moral: Give a boy the powder-can and matches, but not sudden wealth.

THE IRIS.

C. L. ALLEN, NEW YORK.

There are but few flowering plants that have so wide a geographical range as the Iris. Some of the species seem to have been an essential element in the flora of every country. And the character of the flowers, and habits of the plants, are as varied as the climates in which they grow. Notwithstanding the wide difference in range and character there is a peculiar beauty in the flower that is ever pleasing, and wholly dissimilar to that of any other genus.

What are popularly known as the English and Spanish Irises are bulbous plants of rare beauty, but seldom met with in our gardens, because, to use the common phrase when plants disappear, they "run out." Now this "running-out" process is not at all understood, at least so far as the Iris is concerned. Plants do not run out if the conditions of growth are favorable. The cause of failure with these bulbs is due to neglect in not taking them up and replanting them at least once in two years. The new bulbs are formed directly beneath the old ones, and the result is, when they are not taken up for a number of years that the bulbs descend so

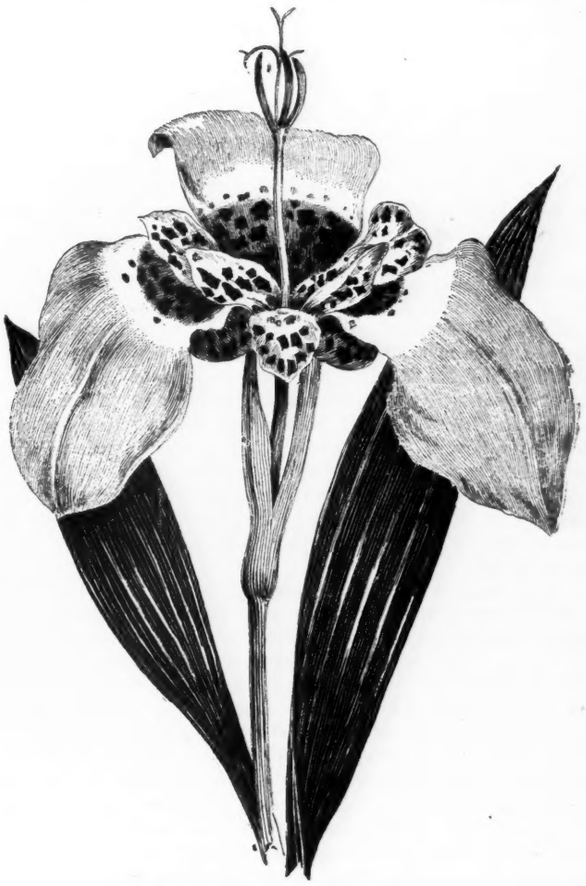
JAPANESE IRIS FLOWERS.

low as to be out of the reach of the air, and are consequently incapable of vegetation, and they no longer appear. These species are both natives of Spain, and quite similar in character; the English being the larger, and somewhat later in its period of flowering. The German Iris is classed among the florists' flowers, and of it there are hundreds of named varieties, all perfectly hardy, which increase rapidly in our gardens. The tubers or rhizomes of this species never grow deep, and, consequently, do not require to be taken up until they outgrow the place assigned them.

The most gorgeous of all the Irises is *I. Kœmpferi*, a native of Japan, from whence come so many peculiar floral forms. This species is perfectly hardy, and, if possible, more vigorous here than in its native home. In a good rich soil, near the water, the plants will attain a height of four feet, producing, freely, flowers from six to nine inches in diameter, both double and single. The colors are pure white, purple, maroon and lavender, while many are marbled, or penciled, with white. They will thrive in either sunshine or shade, but the flowers will remain fresh much longer if the plants are shaded. They do decidedly better when grown in a marshy soil, in partial shade. They are increased by division, which should be done frequently, at least once in two or three years; if this is not done, the center dies out, and the plant loses its vitality. It is the better plan to divide a portion of the clump each year, as the plants do not flower well the first year after division. Divide after the first hard frost, cutting to a single shoot. The most interesting way to grow these Irises is from seed, which should be sown thinly in drills, in early spring, and many of the plants will flower the second year. In a bed of seedlings there will appear every shape and color of flower that the species is capable of producing. Careful selection will soon give a superb collection, the best of which, if desirable, may be increased by division. [A few typical flowers of this species are shown in our illustration.]

TIGER FLOWER (TIGRIDIA).

Tigridia flowers are distinguished for their intense color and positive markings, combined with a form peculiarly their own. The species are natives of Mexico, and there are several varieties, the more common being *T. conchiflora*, with yellow flowers;



THE LARGE TIGER FLOWER.

T. pavonia, with orange-red flowers, and *T. p.-grandiflora*, with much larger and brighter colored flowers. The latter has entirely superceded the original *T. pavonia* in our gardens, as its flowers are far more showy, and the plant is more vigorous and free-flowering. Within the past few years a seedling variety of *T. grandiflora*, with pure white flowers, spotted in the center, has been introduced.

These bulbs differ materially from most, if not all, other kinds in being continuous bloomers. They should be planted as early as convenient, after all danger from frost is past. To produce the best effect they should be planted in masses or long rows, not singly. They will commence to bloom in early summer, and continue until October, and nearly all this time each plant will give one flower daily. An objection to the Tigridia is that the flowers fade quickly, but such rare beauty as they possess should satisfy, even though the flowers bloom but part of the day. They grow freely with ordinary garden culture, preferring a light, rich and moist soil. A dry situation will shorten their period of bloom, although they want full sunlight to succeed well. The bulbs should be taken up

upon the approach of cold weather, or after the first frost, tied in bunches of convenient size, without cutting off the stems, and hung up in a dry room, free from frost, where they can remain until the time for replanting. A place must be selected where they cannot be reached by mice, which are very destructive to them. Many bulbs are lost by storing them in bags or boxes, which exclude free circulation of air, dampness being sure to rot them. [A flower of *T. grandiflora*, much reduced, is presented in our engraving.]

REMOVING TASSELS FROM CORN.

DICE MCLAREN.

The tassel-like male flowers of American corn discharge pollen-dust which is carried by the air to the silky female flowers which grow up from the grains and through the husks at the tip of the ear. The formation of this pollen is a great task, much plant food being stored in the cornstalk to be used for the rapid growth of the tassels during a few days. The claim has been made that the removal of the young tassels would cause the stored plant food and the entire strength of the stalk to be used in the production of more grain on the ear.

For experiment, the tassels were removed from the alternate rows of a part of the Cornell Experiment Station cornfield in New York. Each detasseled row yielded more than the perfect row between, but there are good reasons for believing that the field would have yielded more had all the tassels been allowed to blossom. At the Kansas Experiment Station, when every fourth row was detasseled, this maimed row yielded least. When three alternate rows in the midst of a large cornfield were detasseled, each of the three detasseled rows yielded more than either of the two perfect rows between, but it is probable that a perfect row between perfect rows would have yielded still more.

The observed effects of self-fertilization in plants make it probable that when all the alternate rows are detasseled each perfect stalk between may have to use so much of its own pollen that the attempted in-breeding either fails or is feeble in results. This may be the reason why there are only a few scattered grains on the cobs of cornstalks standing alone, or on the edges of fields. The result may also be partly due to the decrease of pollen caused by detasseling. When the hot winds blast the tassels of corn in the Missouri valley, the cobs grow, but with many grains and rows missing, because they receive so little good pollen. It is not probable that Nature grows too much pollen. The shock of cutting or breaking off the corn tassel may decrease the yield of that stalk, even though it may produce more than the self-fertilized stalk in the next row.

Last summer, at the Nebraska Experiment Station, certain plats of corn had every other row detasseled, but these plats yielded less per acre than the plats which grew naturally with all the tassels. More of such careful experiments are needed to find out the effect of detasseling a part of the corn. Every corn grower can try the simple experiment. Beginning at the middle of the field, count off twenty rows and remove the young tassels from every other row of this first strip. Count off the second and the third strip of twenty rows each. On the other side of the middle of the field, count off a fourth strip of twenty rows and detassel every third row. Count off the fifth and sixth strips of twenty rows each. Mark each strip with strong stakes, and record the date and cost of detasseling. The yield of the first strip compared with the yield of the third strip, and the yield of the fourth compared with the sixth, thus situated, should decide the question. Husk each strip separately, and help other farmers by writing the yield of each of the six strips, and the cost of detasseling one row, to the AMERICAN AGRICULTURIST. What farmers wish to know is whether removing corn tassels increases the yield, and, if so, whether the increased yield repays the extra cost.

Open Ditches.—Open ditches or creeks are important factors upon every clay farm. Often, by a small outlay, their usefulness can be greatly extended. Frequently, by deepening the channel a little, some wet place can be made suitable for cultivation. The putting in of a short underdrain may be made possible by the lowered outlet. These low spots can often be made the most fertile portion of the field, if drained and filled by plowing or scraping. The banks of open ditches should usually be on a level. With a constant flow of water, the ditch should be narrow and deep, and, if inclined to grass over at the bottom, should be kept cleaned out. Across a meadow the ditch should be deep enough to readily drain the water from the adjoining land, and yet with a broad bottom and sides so low that it can be crossed with a loaded wagon or any farming implement, without causing violent shaking.

SOME FUNGUS DISEASES OF THE CELERY.

DR. BYRON D. HALSTED, NEW JERSEY EXPERIMENT STATION.

The trouble known as celery "rust" is due to a fungus bearing the name *Cercospora Apii*, Fr. This blight, as it should be termed —for there is a genuine rust of the celery—has long been known in this country, and is prominent among our destructive fungi. The appearance of a leaflet of celery attacked by the blight is shown in Fig. 1.

FIELD EXPERIMENT WITH THE CELERY BLIGHT.—Two rows, in all respects equal, were selected for the test, and one was sprayed weekly, beginning August 6th, until the close of the season. The substance used was conspicuous upon the plants at the beginning of the experiment, and the chief point was to determine whether the remedy would be effective when used after the enemy was well established. The substance used was the standard carbonate of copper and ammonia mixture, applied by means of a knapsack pump. On November 6th the celery was dug, cleaned of all adhering soil, and weighed. The twenty-five feet of untreated plants gave seventy-two pounds, while the corresponding row that had been sprayed yielded 124 pounds. These figures show that the crop by treatment was increased three-fourths. These figures do not show the absolute difference in gain, for the whole plants were weighed and the root systems were much more nearly alike than the leaf stalk, and it is safe to say that the actual amount of edible celery was doubled in the sprayed row. More than this, it was of better appearance, and would have sold well in the market, while that from the untreated row was unattractive, small, sometimes decayed, and would have brought but little. Looked at, therefore, from the commercial standpoint, the difference between the treated and untreated was that of a fair crop and a practical failure. The treated row was not free from the blight, for it was infested from the outset, and all diseased leaves were purposely retained. It is doubtless true that if all such blighted foliage had been removed and all plants in the field treated, there would have been less disease. This experiment demonstrates, beyond question, that the celery blight can be checked by spraying with the ammoniacal carbonate of copper, even after the fungus has become well established upon the plants, and may make all the difference between a fair crop and one that is too poor to harvest for the market.

FIG. 1. LEAF AFFECTED WITH CELERY BLIGHT.

FIG. 2. LEAF AFFECTED WITH CELERY LEAF-SPOT.

One of the suggestions that this experiment offers is the importance of beginning the treatment early. Very likely the period of greatest susceptibility to the spores of the blight is while the seedling is quite small. At this time, and before the plants are set in the

field, the spraying could be done quickly, and no doubt effectively. It may be a good rule for those who are at all troubled with the blight to treat the seedings as soon as they make their appearance above the ground in the bed, and thereafter twice a week until they go into the open ground. It is even possible that a gain may be found by beginning with the seed itself and soaking it in a fungicide of proper strength before sowing. These latter suggestions can only become demonstrated facts through the time-exhausting

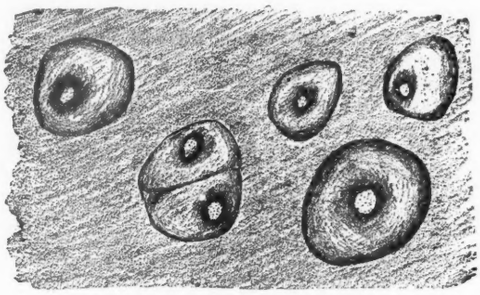


FIG. 3. MAGNIFIED CELERY LEAF-SPOT.

process of actual experiment in the future. It is also possible that some other compound than the one used in these experiments will prove more effective, such as the sulphide of potassium, which, while itself offensive to the nostrils, does not contain any copper, an element that some persons may, although wholly without grounds, object to when applied to the growing celery plant. The tests above recorded were not confined to the two rows, but in another garden the same remedy was applied, in the same manner, with equally favorable results, but as the sprayed and unsprayed rows proved to be of different varieties, and the results, therefore, not being strictly comparable, no weighings were made. It is hoped that these favorable results may stimulate celery growers who have lost a portion of their crop from the blight to equip themselves against a growing enemy, by securing remedial agents.

FIG. 4. SPORES MAGNIFIED.

THE CELERY LEAF SPOT. (*Phyllosticta Apii*, Hals.)—This fungus was found throughout the present season upon the field of celery which was under treatment. It was first discovered while examining the leaves for the Cercospora. After becoming familiar with it there is no trouble in distinguishing the two, even when growing upon the same leaf. The Phyllosticta differs in the nature of the spot, which begins as a dull-brown patch, never becoming of the light, ashy color so characteristic of the Cercospora in one of its stages. In the Phyllosticta the leaflet may be attacked only in one spot, which, continuing to enlarge, causes the whole to become brown and

FIG. 5. LEAF AFFECTED WITH SEPTORIA.

lifeless, followed by a torn condition. Two or three of these large, dead, shredded places may be all that the leaf contains, while the balance is healthy and deep green. In Fig. 2 is represented a portion of a leaf affected with *Phyllosticta Apii*. A part of the diseased area is shown magnified in Fig. 3, where the spore cavities appear as dark dots upon the surface. The spores, as they appear when viewed with a high power, are shown in Fig. 4. This is a rapidly-growing fungus, is particularly fond of moisture, and flourishes in the shade, usually being found upon the younger or lower leaves. While experiments have not been made upon this leaf-spot fungus, it is probably true that the same remedy as that for the ordinary leaf blight (Cercospora) and applied in the same manner would prove effective. It will be important to begin early with the spraying.

ANOTHER LEAF BLIGHT. (*Septoria Petroselini*, Des., var. *Apii*, B. & C.)—While looking for specimens of the Phyllosticta previously mentioned, a blight was found in considerable quantity that proved to be a Septoria. The appearance of the blighted leaves is shown in Fig. 5. This disease differs from the others, to the naked eye, in the more complete killing of the leaf affected. It has been shown that the Cercospora gives a spotted appearance, while the Phyllosticta produces an occasional large patch that is dark brown and dead. The blight now under consideration often causes the whole leaf to become brown, with small, black dots scattered over the surface. A plant at all affected is quite apt to have the whole foliage diseased. A magnified view of a small portion of the affected part is shown in Fig. 6, with some of the spore-bearing bodies. The spores, isolated and still more magnified, are shown in Fig. 7. Professor Chester, of the Delaware Experiment Station, has found this species for the first time in his State, and reports it as quite destructive, "causing, in extreme cases, a complete wilting of the leaves, and in the case of younger growths a complete destruc-

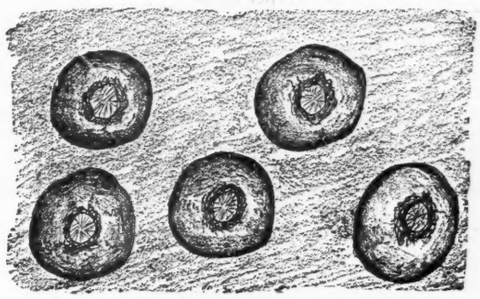


FIG. 6. MAGNIFIED VIEW OF SEPTORIA.

tion of the entire plant." The only mention of a Septoria upon celery that the writer has thus far found is by Briosi and Cavara, who figure and present a specimen of the species upon celery, namely, *Septoria Petroselini* Des., var. *Apii.*, B. & C., collected at Pavia, Italy, in 1890. The American specimens, while not agreeing closely in the spore measurements, may be considered as the same variety.

PANSIES.

Pansies, like all other flowers, are generally most sought when they are the most difficult to be had—out of season. They are regarded as spring flowers, and justly so, as they endure considerable frost without injury, and do not perfect their flowers in extremely hot weather. Yet, if protected from the sun with a screen, and the soil be kept moist, as perfect flowers can be had the entire season as during the early spring months. For early spring flowering the seeds should be sown in August, and the plants protected by a frame during winter; for midsummer flowers, sow the seed as early in the spring as the soil can be worked. But October and November are the months for pansies, and the best we have ever seen were in these months, from seed self-sown in July. The seeds had ripened on our spring-flowering plants, and when the capsules burst the seeds were thrown in all directions. They grew as weeds grow, and they carefully secreted themselves among other plants for fear of being treated as weeds; and there, among lilies, tritomas, and eulalias, we found as fine pansies as we ever had growing under the best of care. These plants gave us an abundance of flowers until the middle of November, when nearly all other flowers were killed by freezing. To insure a bountiful harvest of pansies after more tender flowers have been killed by the frosts, sow the seed in July, protect the plants against the midday sun, and transplant into any vacant, rich spot.

FIG. 7. SPORES OF SEPTORIA.

Broad Bases for Windmill Towers.—The recent wind storms have blown down thousands of windmill towers. Much of this loss is the result of narrow bases for the towers. The greater the spread of the corner posts, the more resistance they offer to the force of the horizontal wind. The steel towers could be built with graceful curves similar to those of the Eiffel tower of Paris.

CANE SUGAR CULTURE IN FLORIDA.

JAMES K. REEVE.

History sometimes repeats itself in agriculture as well as elsewhere. "Before the war," the State of Florida contained a number of large and profitable sugar plantations. Among the most noted of these were the Braden plantation on the Manatee river, the great Yulee plantation on the Homosassa, and the Turnbull plantation on the Indian river. Each of these embraced thousands of acres, each carried hundreds of slaves, and one and all were cultivated in that large, open-handed and wasteful manner that was typical of the old plantation and of slave labor in the "Forties." The sugar planters were then the land barons of Florida, and were looked upon as good agriculturists. A planter who would conduct his business now as they did then, and obtain no greater results from a given amount of land and labor, could not long keep himself from failure. The plantation sugar of those days was almost invariably "open kettle" brown sugar, with the molasses dripped from it. With bone black and clay, a very little refined sugar was made—of the old-style loaf—but the process was too laborious and expensive to be much practiced. A ton of cane, by the processes then in use, yielded on the average sixty to seventy-five pounds of raw sugar to be sent to distant refineries.

FIG. 1. VIEW OF THE ST. CLOUD SUGAR WORKS.

At the present, with improved apparatus, a planter expects to get at least one hundred pounds more than that, or nearly three times as large a yield, and refined sugar at that, ready for immediate consumption. Sugar was then a rarer article in our markets than now, and consequently commanded a price that made a profit possible from methods that now could only make a loss. Brown sugar sold at from eight to twelve and a half cents per pound, and loaf at from twenty to twenty-five cents. The war ruined the industry so completely that it did not revive upon the restoration of peace, and for a quarter of a century the only sugar made in Florida was such as the settlers produced from little patches of cane which they cultivated solely for their own needs. From a commercial point of view, no sugar was produced in Florida until 1885, when a small amount was manufactured near Kissimmee from a field of cane that had been planted on some reclaimed swamp land in 1883. The result from this was so satisfactory that the company which had made the experiment began preparations for at once extending the industry. In 1886-7 one hundred acres were planted; by the close of 1888 this had been increased to five hundred acres: and for the season of 1891-2 about nine hundred acres were harvested and manufactured.

The establishment of a sugar plantation of this magnitude in what may fairly be termed virgin sugar territory is an important and noteworthy fact. If cane can be successfully grown and profitably manufactured here, it can be also upon many hundreds of thousands of acres in the southern portion of the State. There are some conditions, aside from that of the possible acreage, that seem to point toward Florida as one of the most desirable sections for the extension of the industry. The most important of these is the already well-ascertained fact that the cane can be cultivated at a much less expense than in any other sugar territory in the United States. This is largely due to the fact that the cane will rattoon, and may consequently be cropped continuously for a number of years, instead of having to be replanted every third season. Just how long it may be cropped with profit has not yet been determined. A portion of the cane being worked this season is from the sixth successive crop from the same land, and it shows no diminution in yield. From this, and from careful examination of several pieces of old stubble, at various points, it may be safely asserted that the cane will rattoon for at least ten years. This will put the Florida planters upon the same basis in this respect as their principal competitors, the planters of the Island of Cuba. Another important point in sugar culture is the length of the season during which the cane may be harvested and worked. In Louisiana the season lasts but little more than sixty days, upon the average, and is often cut short by untimely frosts. At St. Cloud, Florida, it has had an extreme length of five months—from December 15 to May 15. Planters are not compelled to begin working the cane until it is thoroughly mature and the sugar juices are at their maximum. As to the production of cane per acre and the yield of sugar from a ton of cane, the experiments thus far indicate that Florida will equal any sugar-producing country of the world. During the season of 1888-9, the first year that the work assumed large proportions, more than three hundred and fifty acres of cane were cut, which averaged twenty-four tons per acre. Nearly one and one-half million pounds of sugar were produced, or an average of 168.21 pounds per ton of cane, or 4,037½ pounds per acre, besides 1,600 pounds of molasses. This result has been accomplished by crushing, and is as good as any mill in the country can show by that method. An experiment is now being made with a diffusion apparatus, but of a different type from those in use in Louisiana. The cane is shredded, and carried to a cylinder which is already filled with water. Into this cylinder it is forced under high pressure, displacing an equal amount of water which can escape only through the shredded fiber. This, it is believed, will extract every drop of the sugar juices. Not enough has yet been done to prove its practicability but it is hoped that some accurate data may be had, by the end of the present season, from this novel process. The

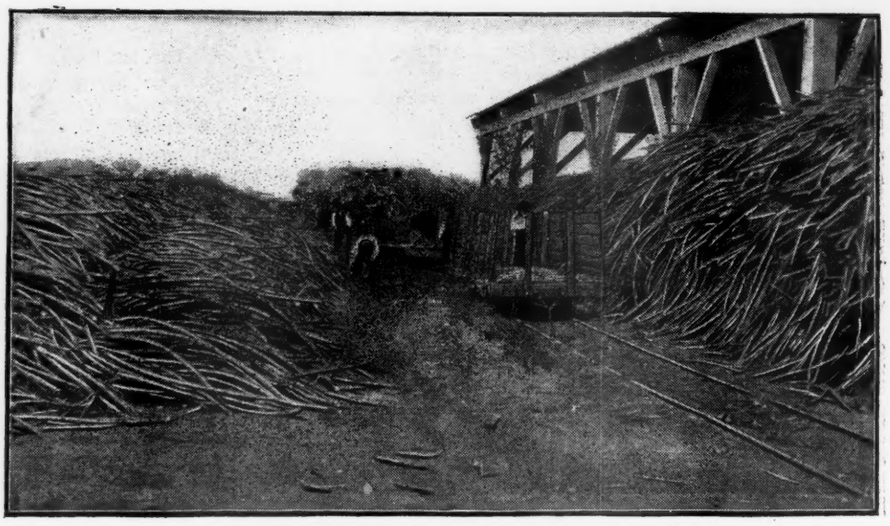


FIG. 2. TRANSPORTING CANE TO THE FACTORY.

sugar factory at St. Cloud was built with an eye to the development of a large plantation, and it is estimated that it can handle the product of two thousand acres. That such a plantation and factory should exist in a State which has not been considered as a sugar producer, is in itself a notable fact. But even of more interest is another fact, which is, that this plantation is upon land that was, until a few years ago, a portion of a vast swamp, totally submerged, but now reclaimed by the most extensive system of drainage that has ever been put in operation in this country. For centuries this land has been inundated, and has supported only the rank aquatic growths of the tropics. These, in their decay have formed immense deposits of organic matter, varying in depth from three feet to twenty-five feet, thus affording almost inexhaustible stores for the sustenance of the cane, which as is well known is one of the rankest feeders. It is these deposits which make possible the continuous cropping of the lands by long-lived sugar cane.

A great portion of the Peninsula of Florida has been considered of no value for any practical purpose. The "Everglades" has been a synonym for all that was worthless, from an agricultural point of view. The wilderness known by that name had been explored only enough to show that it was neither land nor water, but a jungle of swamp, saw grass and aquatic growths. It was rather a daring thought that engineering science could transform it into a garden "rich with all blessed conditions." Yet this now appears to be the thing that is to be done. The same methods that have removed from three feet to eight feet of water from the lands along the upper Kissimmee will in time lower the Okeechobee Lake so that it will completely and permanently drain all the vast swamp-prairies that now surround it. The lands which will thus be given to cultivation will naturally, from their quality, location and climate become sugar lands, and it may be that these will become a large factor toward giving us a domestic sugar supply. There is another point in this connection which is worth noticing, and that is that in time much sugar will be produced upon Southern pine lands. It is true that we are accustomed to think that cane can be profitably grown only on deep rich soils. It is true that such land will make the heaviest growth of cane, but experiments made in Florida and southern Alabama, have shown that while the tonnage per acre is less, the value per ton of the cane which has been produced on pine land is often greater. Some pine land cane has been bought at the St. Cloud factory at $5.00 per ton, and as fifteen tons per acre might be considered a fair crop it will be seen that it may be grown at a profit, even with the expense for commercial fertilizers, which must of course be used. It is my belief that within the next decade the cultivation of sugar upon Southern pine lands will become commercially practicable, and our sugar area will be extended then to a point of which we now hardly dream.

[The accompanying illustrations engraved after photographs, present in Fig. 1 a view of the St. Cloud sugar works; in Fig. 2 a train bringing cane to the factory; in Fig. 3 a cane field being cut.]

Fig. 3. CUTTING SUGAR CANE NEAR KISSIMMEE, FLORIDA.

TRANSPLANTING SEEDLINGS IN MIDSUMMER.

G. A. WOOLSON, VERMONT.

It often happens that late-flowering annuals or biennials must be transplanted in July, whether the weather is favorable or otherwise. A few hours more in the hotbed or cold frame will ruin them, even if protected by cloth sashes; so into the ground they must go, although the soil may be dry as dust and ashes, and the mercury at 80° in the shade.

Transplanting should always be done after sundown. A thorough wetting of the bed should be given in the first place, and the plants puddled if necessary. Protection from the sun will be necessary for several days, often until cloudy weather sets in. Just how this shall be done is an item of considerable importance, where a large number of seedlings are set out at one time, as all are not supplied with the regular folding plant protectors designed for that purpose. Various devices have had their day; newspapers weighted with stones are abandoned, even in rural districts; likewise the capacious rhubarb leaf; the one blows off, and the other wilts and falls on its victim. Flowerpots, if large enough, will do very well if the supply is equal to the demand, but supposing it is, nobody cares to handle over fifty or seventy-five pots twice a day!

A very simple way out of this difficulty is to use old umbrellas and parasols. If your own attic is not equal to the occasion, take up a collection among your unhorticultural neighbors. Any of them will, doubtless, be willing to lend this sort of an umbrella. Straight-handled ones are preferable, as they can be adjusted to any depth in the ground, and, if properly placed, will withstand a strong wind; they also have the advantage of admitting air, while affording shade, which is essential to the speedy establishment of plants in new quarters. The sight of a dozen or two umbrellas of various ages and sizes spread in one's garden is a trifle unique, and one can easily fancy the Liliputians holding a mass-meeting of some sort or other. However, the results from this novel method are satisfactory, and we have fresh-looking plants all the day long, even with a burning sky overhead.

HOUSEHOLD

Keeping Summer Boarders.

ALICE CHITTENDEN.

The keeping of summer boarders is, each year, becoming more and more a business with farmers in localities remote from large cities. There are hundreds of dairy farms throughout Sullivan and Orange counties, New York, and the mountainous districts of Pennsylvania, where the milk that is sent to New York city brings the farmer only one cent a quart, after it is delivered at the nearest station. There is no market for the fruit and fresh vegetables, and but for the summer boarder these would not be worth the growing. Now the keeping of boarders is too often a thankless task. The city boarder is sometimes a grasping person, who would take all and give little. He will let his children climb the choicest fruit trees, and destroy what they could not eat; he will let them waste at table more than a grown person would eat, and then expect to pay half price for board. Let us hope that these are the exceptions that prove the rule.

Since there are such exceptions, the arrangements for boarding should be of the strictest business nature on both sides. Farmers who intend to open their houses for summer boarders should not advertise in glowing terms the "home privileges, the fruit, fresh milk, eggs and vegetables, fishing and shooting," unless they are really prepared to give these advantages. Last summer it was my misfortune and privilege to spend several months at one of the most beautiful farming sites to be found within six hours ride of New York, where the above inducements were held out to the unwary exile. It was, indeed, a privilege to breathe such air and to live among the grand mountain scenery; but, unfortunately, the air made you hungry, and the dole of meat placed before you at breakfast or dinner left you very much in the frame of mind, or state of appetite of Oliver Twist, when he asked for "more," an experiment which you did not care to repeat. Tomatoes were rotting in the garden, but never made their appearance upon the table in any shape except sliced raw, and only very occasionally in that. Green corn was not brought to the table until it was too old to eat, and noses were so carefully counted that after the dish had made the rounds of the table only two or three ears were left. Eggs were seldom served, and one to each guest was carefully apportioned when they were. Milk that sold for one cent a quart was served from a side table in meager half glasses.

I think this state of affairs was more the result of ignorance than of meanness. There are too many farmers who have not yet learned to appreciate the value of vegetables on their own table. They probably thought it more elegant to fill the glasses only half full of milk, and as one who lives on a dairy farm naturally becomes surfeited with milk, they did not comprehend that their boarders would gladly have had more of it. The rate asked for board was only six to eight dollars per week, and as meat, in out-of-the-way places, is almost always higher than in cities, any reasonable person would not demur at small portions of that expensive commodity, if articles that were almost valueless had been given in abundance. If our hostess had regaled us with plenty of boiled young green corn, stewed potatoes, oatmeal, and some kind of hot bread, or tomato toast, and boiled eggs, or green corn fritters with broiled ham and fried eggs for breakfast, I think every one would have been perfectly willing to have had steaks and chops left entirely off the bill of fare on those days. Vegetable soups made with milk might have made their appearance daily, and the farmer have been none the poorer. With two or three fresh vegetables daily on the dinner table, the presence of the thin, scraggy piece of soggy looking mutton would have been less a sarcasm and more a matter of indifference to the hungry boarders. A huge dish of green beans, cooked as every farmer's wife should know how to cook them, with a square of pork in the center boiled to an almost jelly-like consistency, would nearly constitute a dinner in itself. Cold boiled corn and potatoes stewed in milk would make an appetizing supper dish.

Country people make a mistake when they think city guests are unused to and do not care for vegetables. They are astonished to learn that not only good milk, but real cream, can be purchased daily in the city. The best farm in the land cannot produce the variety of fresh vegetables and fruit that the city markets offer. On this particular farm, milk that twice during the summer was made into delicious cottage cheese for supper, was daily thrown away. A luxurious table could have been spread with that which they threw away, either through ignorance, or because they were unwilling to take the trouble to prepare it. A family seeking board, in answer to an advertisement offering all the peculiar privileges of the country, would save themselves much annoyance if they would explain in detail their conception of that offer.

The host, on his part, should definitely point out which parts of his farm and field were open to the children of his guests. Which fruit trees, if any, they would be permitted to ravage, and no sensible person could take offense if at the same time he firmly stated that no wastefulness would be allowed. If a farmer's wife admits into her house small children and infants, she should expect to allow a certain license. It is too much to expect a family to remain in your home for months without allowing their children some home freedom. To this end so furnish your houses that the least possible damage may be done. If I wanted to keep summer boarders I should take the greatest possible pains to make the children happy. I have seen sensitive children positively suffering in health from the restraint that was put upon them in their summer home. The subject is one that requires not only strict business arrangements, but kindly consideration on the part of both host and guest.

Having Company.

MRS. M. C. HUNGERFORD.

Hospitality may cease to be a virtue by its over use, in some cases, but a housekeeper is rather more apt to go to the other extreme, and let the virtue rust for the want of use. We are told, in the New Testament, to use hospitality without grudging, but it is not always a question of grudging, for many a woman would gladly spend twice what it costs to entertain her friends, if she might only be spared the worry and trouble of it herself.

We make a great mistake when we change our family customs in entertaining a guest. A visitor is often made unhappy by seeing the turning and overturning her presence causes to her friends. If one is liable to have much company it is better, by far, to make no especial change for them. Plain living may be the family custom, but the meals should be well cooked at all times, and the appointments of the table, even if very humble in quality, should be so neat and well placed, ordinarily, that it will not be necessary to change them when friends come to visit. It saves trouble and it promotes a feeling of self-respect in the members of a family, to feel that the everyday manner of living is sufficiently comfortable for guests to share, and it makes the visit enjoyable for all concerned to have it so.

Of course, if people are formally invited to a single meal and to meet other people, that may be looked upon as an "occasion," and some ceremony and especial preparation is in order and to be expected, but it is of company who stay a few days, or of those who drop in unexpectedly to a meal, that this refers.

Another thing which is a burden to both visitor and visited, is too much attention. It should be remembered that sometimes a guest may weary of the constant presence of some member of the family, and long to be left alone for a while. It would not be right to show neglect; at the same time, one should not be so overwhelmingly constant in civility as to hamper a friend's movements.

It is a good rule to have such excellent table manners enforced in daily life, that no greater care is needed when strangers are present. Children should be taught the proper use of everything on the table, and, above all things, gentle manners for both children and grown people must be practiced. A good rule for both hostess and guests is to be good-natured under all circumstances, and never allow themselves to be fretted. Even if their dispositions are not naturally congenial, they should make their tastes conform to each other's customs and habits during the days they pass together.

Take Care of Your Books.

M. W. EARLY.

Of late years, there has been a great decrease in the cost of books, and a consequent increase in their diffusion; a state of things which is, on the whole, a benefit to the masses, but still not an unmixed one, for of course with the enlarged library harvest, there is a corresponding increase of tares and weeds. Then the increased facility of getting books tends to lessen our relish for them, and to make us less careful of them. In my young days, a book, and especially an illustrated one, was a rare occasional treat, and was appreciated accordingly. Nowadays such books are so easy to get that children become satiated with them and take very little pains to keep them intact.

I am a great advocate for covering books. A child's schoolbooks, in constant use, had better be covered with scraps of stout gingham, fastened securely with needle and thread. The books they read for amusement may be covered with stout wrapping paper, with the title written on the outside. There are a few good old-fashioned rules which it is well to keep up in connection with our children's books. Make them wash their hands thoroughly before taking up a book to read. Never allow them to eat over a book, and don't let them double it back, to keep the place. Watch your books attentively for the first loose leaf, and replace this immediately, not laying it by, to be lost or torn before a convenient opportunity occurs for mending it. Keep a little pot of mucilage, with a brush in it, for replacing loose leaves, and you will find that this simple apparatus will greatly assist in keeping books in order. It will enable you, for instance, to promptly replace the outer page of a magazine which sometimes gets torn off. I find great efficacy in the use of a stout needle and flax thread, for tightening the bindings of books when they begin to relax. I sometimes rebind a schoolbook, or some other volume, not very ornate, sewing the two covers to a strong strip of hickory shirting, at the back, and this homely arrangement has enabled the book to be used several years longer.

In regard to periodicals, I wish to make a few suggestions which are the result of experience, not of theory. If you take any weekly say, for instance, *Youth's Companion*, or *Harper's Weekly*, at the end of each month take the issues belonging to that month and sew them together with a coarse needle and flax thread. Sew on an outside cover of very stiff brown paper, such as is used for express packages, marking the title and date of the periodical on it. This simple plan I have found of the greatest advantage. It has enabled me to keep an unbroken file of periodicals, so that other persons may, for years to come, take pleasure in reading the serial stories, the interest of which would be marred by a single "missing link." This is the only plan by which I have ever been able to preserve every number of a periodical. Then they are kept so clean by the outside paper cover, and four or five of them together form a volume not too bulky to be held conveniently. Of course, the same plan will answer for periodicals not coming as often as once a week, as for instance, *Farm and Home*, or any other semi-monthly. In this case, you need not sew them together oftener than once in two months, though I must say, you secure periodicals better by sewing them together promptly.

I would also recommend the plan of putting a stiff paper cover on any seaside book of sufficient value to make us care to keep it. Sometimes we get the finest productions of literature in this form, and if we will protect them as suggested, they will last as long as if bound in muslin. Otherwise they will soon become tattered, and yellow from exposure to air and dust.

Test the Fruit Jars.

MRS. H. H. TURNER.

Most housekeepers know how to prepare the fruit for canning, and understand it is essential that the contents should be very hot, in order to

expel the air, and the lid sealed while hot; and yet, after all is done, the jars having been wiped and stored away in a dark place, they find that something is the matter, although all the jars were treated alike. Some ferment, and the cause is a puzzle worthy of the puzzle department. The trouble is in the jars. The makers are constantly improving them, and new molds are made that are not exactly alike, so some lids will not fit on all jars. It is well to keep the jars, lids and screws together, but this cannot always be done. One lady keeps hers tied in a small bag to the neck of the jar when empty. To remedy the trouble, the jars must be tested. See that the lid will go

FIG. 1. WATERPROOF BATHING BAG.

easily into place without the rubber. Now put on the rubber, then the lid, put a little water in the bottle, and screw up tight. Wipe dry, and invert on the table. If it leaves moisture, remove to a dry place, and if it continues to leak, undo the whole thing. Fruit will not keep in that bottle, for where water can get out, air can more easily get in. Fruit, properly canned, will keep anywhere. Canned fruit keeps in groceries in glass, or tin, with the bright sun shining on it all the year round, as we have all seen. The trouble is in the jars, or the canning, and, if that is done right, and the bottles are right, success is assured.

Convenient Bathing Bag.

The bag shown in Fig. 1 is very convenient for carrying a bathing suit to and from the beach. If it is to be used for this purpose, it should be made of waterproof cloth, but if for wraps, grey or brown linen will be more suitable. By following the directions given, a correct pattern of the bag, as illustrated in Fig 2, can be obtained. Cut a 24-inch square of paper; draw a line ten inches long across one corner; cut the opposite corner off the same depth; and draw a line across it. These lines designate where to place the piece through which the strings are to run. The bag is bound on all sides with braid, which is firmly sewed on, and then ornamented with fancy stitches in heavy silk. Pieces of the braid are stitched on the under side to run the shirring through. The bag is folded, as indicated by the dotted lines. The squares in the cor-

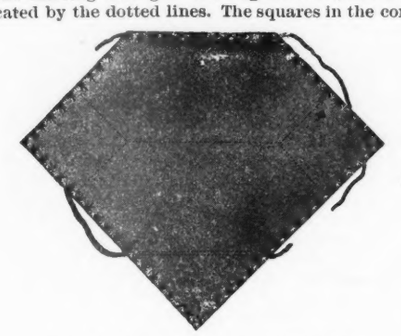


FIG. 2. PATTERN FOR BATHING BAG.

ners are folded so that one-half comes on the front, and the other half on the back. These are fastened in place with a few stitches. The shirring strings are run through double, so it will draw up easily. A button and buttonhole keep it together.

The Farmer's Fresh Meat Supply.

ELLA ROCKWOOD, MICHIGAN.

If the farmhouse is supplied with an ice box or refrigerator for keeping meat, made on the same plan as those in the city markets, meat may be kept fresh and sweet for two weeks in hot weather. Thus equipped a number of farmers may join, and agree to take a share of the meat when one of the number kills a fat animal, each to take his turn in furnishing the others. Hardly any neighborhood can be found where there are not at least three or four families who would be glad to make this arrangement, thereby affording a supply of good meat at a nominal cost. This plan is also an economical one, as the price that could be obtained for the dressed meat, if it were sold, would not be more than half what is asked if the same meat were bought back again.

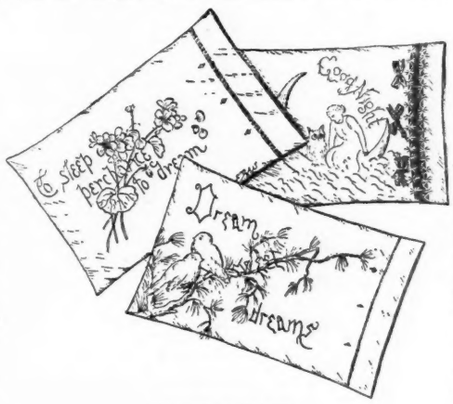
Where there is no ice, meat may be kept sweet for a number of days by immersing it in buttermilk, changing it for fresh every other day. This process will often sweeten meat that has become slightly tainted. As a rule, however, meat in that state is unfit for human food, and should be thrown away.

Meat may be kept in cans if treated in the following manner. Cut into rather small pieces and cook thoroughly. Season well with salt and pepper, and let it cook out all the water, so that nothing but the fat is left in the kettle. Remove the bones, and fill glass cans with the meat, pressing down well. Pour in what fat is left in the kettle. If not sufficient to cover the meat melt some suet, and fill the cans to the brim. Seal as usual and keep in a cool place. This pressed meat is delicious when eaten.

Stone crocks may be used for potting meat. Instead of sealing like the fruit can, tie over the top a paper well coated with the beaten white of an egg, then a good layer of cotton batting, over that another paper to keep out the dust and air. Beef, corned with but little salt and well soaked, is very palatable when boiled or roasted.

Pretty Sachets.

The little pillow sachets, shown in the accompanying engraving, are intended to be laid on or



PILLOW SACHETS.

in a bed. They are made of white linen handkerchiefs, using the hem for a border. The pillow is made of several layers of cotton sprinkled generously with sachet powder and tacked together, then slipped into the case and fastened by tiny buttons and buttonholes. The designs are outlined in wash silk.

A Pretty Cloak for a Child.

CONSTANCE B. WHITE.

This stylish little cloak is equally handsome made of either cream-white ottoman silk, Bedford cord, or the regular écru cloth which comes specially for the purpose, and is 55 inches wide. The first size will require one and a half yards of cloth this width, two and a half yards of surah silk for lining and two and one-half yards of lace at two dollars per yard. Three handsome pearl buttons finish the front. The chest measures five inches across either front, the back eight inches. The depth of the waist from the shoulder at neck is seven inches. The neck measures twelve inches, the arm-size, nine inches. The sleeve is eight inches in length; the hand-size seven inches; the depth of skirt seventeen inches, and width of skirt sixty-three inches. The sleeve is gathered to a tight band of cloth lined with silk, and has an up-turned cuff of lace. Turn in at the top of the sleeve and lining to allow for letting down when the child grows. Also turn in three inches of the skirt-lining for the same purpose. The lining in the back of the waist should be folded in a plait, before making, to allow of an inch for "give." Gather the skirt and join to the waist with

A STYLISH LITTLE CLOAK.

a bias fold of cloth and hem down on the wrong side, overlapping the waist-lining. This is also pretty when made of white piqué, for summer, using handsome embroidery in place of lace, and lining with twill.

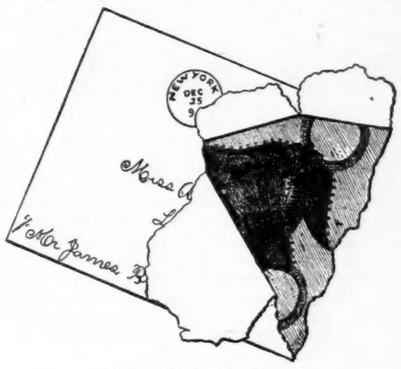
An Easy Way of Pickling Onions.

A. S. BELMONT.

To a quart of vinegar allow one small teaspoonful of salt, four small cayenne peppers, a few blades of mace, and cinnamon broken in pieces, a few whole grains of allspice, and one or two cloves. Peel the onions as small as required, put in a porcelain or granite kettle, pour over them the vinegar and spices, cover closely, and set on the back of the range, allowing them to heat very slowly, so that the vinegar may permeate, without softening, the heart of the onions. A little experience will show when to bring them to a boiling point, then put in cans in the same way as fruit. If allowed to boil more than a minute or so, they will shrivel and not look well, but if the vinegar is good, and the canning process perfectly performed, they will keep in excellent condition an indefinite time. Many people prefer them pickled without spices, simply allowing a little salt to the vinegar. Pickled onions are more wholesome than most pickles in general use, and are worthy a place on the table of an epicure.

What to Send in an Envelope.

The contents of this envelope, herewith illustrated, show what can be made for a few cents



RIBBON SLEEVE HOLDER.

and sent post haste for two cents. It is a ribbon sleeve holder, to hold the dress sleeve down while drawing the coat sleeve over it. One ring is slipped over the thumb, the ribbon wrapped

around the sleeve several times, and the other ring slipped on the thumb, then the ribbon is drawn out, hung up beside the dressing table until needed again. This one is made of maroon satin ribbon. It takes just one yard of three-fourths inch width and two brass rings with a covering of garnet silk. They can be bought ready for use, or crocheted at home. One end of the ribbon is tied through the ring, and the other sewed on it. These little articles sell readily at fairs, and are quite decorative when a number, made of shades that blend nicely, are placed together.

Sack for a Little Girl.

B. W. KEELER.

The sack illustrated in Fig. 1, is made of cream-white opera flannel and requires one-half yard 27 inches wide. The back measures eight inches across the shoulders; the fronts five inches

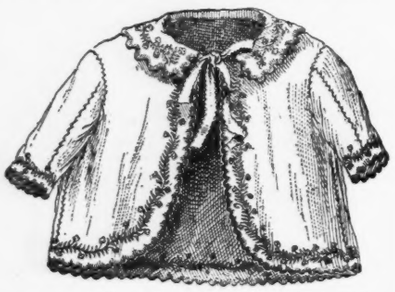


FIG. 1. SACK FOR A ONE-YEAR-OLD-CHILD.

each; the length of the sack from the shoulders to the bottom is ten inches; the sleeve eight inches at the longest part; the collar is two inches deep; and the neck measures ten inches. These measurements are suitable for a child up to the age of one year, and may easily be enlarged for older ones. Scallop the edge and work with heavy white silk, and embroider a vine like that shown in Fig 2. Embroider the leaves with white silk, the flowers, forget-me-nots, in pale blue with yellow centers. Fasten at the neck with narrow white ribbon. This will be found very pretty when worn with thin white or gingham dresses.

Cleaning Painted Surfaces.

The neat housekeeper delights in having both painted and unpainted portions of the room look neat and clean. To aid them there are many preparations offered, but most of these contain soda, which make the hands rough and sore. Though they will remove the dirt, they also take the paint, if applied too strong, and, even when used in moderate quantities, the gloss of the paint or varnish is greatly deadened. For this purpose, use only the best soaps, as they contain little soda. If they leave the hands soft and smooth, they are suitable for cleaning paint. Before washing woodwork, dust it thoroughly, especially about the doors, mantels, and windows. In washing, always

FIG. 2. EMBROIDERED EDGING.

use two cloths, and no cloth is better than old flannel. Have a pail half full of hot, soft water, dip one cloth in the water, rub on some good soap, fold the soap inside, wring out the cloth so the water will not drip or run down on the paint, paper, or wall, rub briskly over a small surface, wring the washcloth dry as possible, wipe the washed surface, then take the clean or wiping cloth and rub the surface dry. The same process applies to painted walls and ceilings, only, being large and unbroken surfaces, great care should be exercised, or streaks will remain.

In washing windows, always avoid the use of strong soap. As usually done, the semi-annual window washing injures the putty more than the whole year's action of rain, sunshine, and frost. If soap is used, let it be of the best. Use it quickly, rinsing thoroughly as soon as the washing process is completed.

Always clean the floor thoroughly before cleaning the walls. To prevent water spattering on the

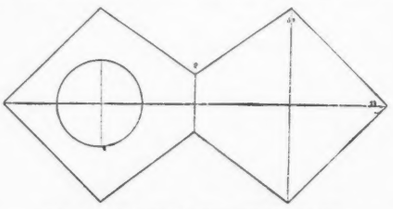


FIG. 1. DIAGRAM FOR JEWEL CASE.

walls at cleaning time, set the pail on a piece of carpet, which will absorb the spilled water, and make the whole operation more business-like and comfortable, if there is such a thing as comfort in house cleaning.

A Handsome Jewel Case.

The foundation for the jewel case is made of heavy pasteboard, according to the outline given in Fig. 1. It is covered on one side with eider-down flannel. The rings which form the boxes are an inch deep. These are also covered with the flannel which makes a soft nest for trinkets. The bottom of the case is covered with silesia. The boxes are sewed on as indicated by the rings on the diagram, Fig. 1. The cover is made of a strip of soft silk, 7x14. The ends are rounded, and it is hemmed on all sides. This is covered with white lace, laid over the boxes, caught down the middle and fastened with a bow of satin ribbon, Fig. 2. The case can be made of any color the taste

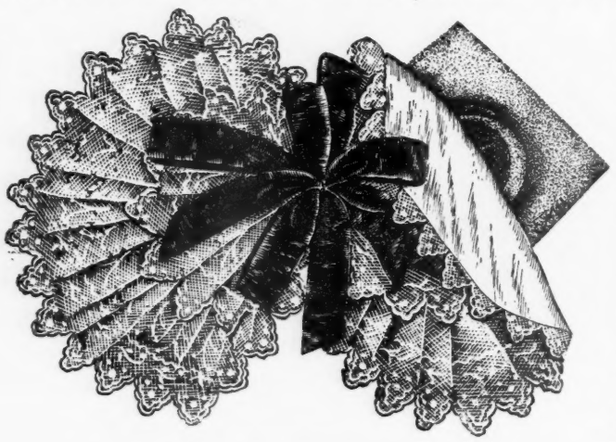
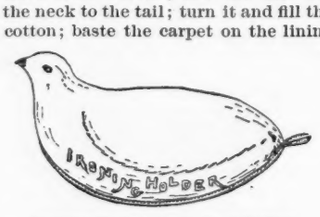


FIG. 2. THE FINISHED CASE.

suggests. If the eider-down flannel cannot be found to correspond with the color chosen, white will do for any color. It comes in delicate shades of pink and blue.

Serviceable Ironing Holder.

The cover for the novel ironing holder, shown in the accompanying illustration, is made of light brown Canton flannel, the wings and eyes of the bird being outlined with a lighter shade of worsted. To make a quail holder, cut two pieces of Canton flannel the shape of the bird, two for the lining out of ticking the same size, but extending only to the neck line; then two more of carpet or heavy cloth a trifle smaller. After the wings and eyes have been worked, sew the bird together from the neck to the tail; turn it and fill the head with cotton; baste the carpet on the lining; and



CONVENIENT IRONING HOLDER.

tack it on in several places; sew the lining in a seam across the top, and baste it in the bird; bind all together around the bottom with brown braid; and sew on a loop of the same for hanging it up.

A Novelty Vase.

D. H. VROOMAN.

A novelty in the way of a vase may be made from a gourd. Select a gourd that has a handle without a crook in it, and cut off just enough of the stem end to enable you to remove the seed. Place it to dry, and when it is thoroughly dry, give it a coat of paint, and then paint a spray of flowers, or grasses, on the sides. After the paint is dry, varnish it. This makes a pretty receptacle for flowers, as the gourd will hold water. If you prefer, you can gild the gourd instead of painting it. The accompanying illustration shows a vase made from a gourd.

A PRETTY VASE.

How to Escape "Fly Time."

W. D. WORCESTER.

The hard work and the heat of summer are made more difficult to bear because of the constant worry of "driving flies." To find a partial means of relief, at least, from these pests, it is necessary to study natural history in so far as it relates to their habits and manner of multiplying. It is declared, on good scientific authority, that the swarms of summer are probably produced from a few individuals that have lived through the winter in protected nooks, such as they can find in clothing, behind picture frames, and in various corners of stuffed furniture, or other convenient hiding places. Scientific investigation also has shown that the eggs are laid in filth, and the young hatch out there and thrive upon decaying matter. These facts surely give a hint as to the prevention of a large proportion of the swarms that infest one's premises in summer. Any kind of manure near a house is sure to be a breeding spot for flies, for this is just the place where they delight to lay their eggs. The pigpen should not be near the house, as is so often the case; nor should piles of stable dressing be allowed to accumulate when the stable is near, or joined to, the house. Pails of broken food and kitchen refuse are frequently to be seen near the kitchen door, or in an open shed adjoining the kitchen, that attract all the flies within a large radius. Let every place, where flies could thus breed, and everything that would attract them about the door, be cleared away, and kept so, and the small number of these troublesome insects will occasion surprise, especially if one is at some little distance from the houses of neighbors, who are not thus particular. Still better results will be secured if, late in the fall, or during the winter, a careful search be made for flies that have gone into winter quarters. Each one of these that is destroyed will lessen the number for the following summer. It is folly to suppose that there will be entire freedom from the annoyance even when the two points mentioned, have been carefully attended to, but it will be reduced to a minimum.

The comfort of screens in every door and window that is used is not frequently enough enjoyed in farmhouses. A little exertion is all that is needed, except a very small sum to be expended in wire nails and netting; for screens can be made at home by any man with half a knack for handling tools and at times when he could not well be doing other work. On windows where it is not necessary to open or shut the blinds frequently, it is a simple matter to tack upon the lower half of the window casing, upon the outside, the

inexpensive cotton netting—a plan that takes but a few moment's time, and a few cents in money, and is worth dollars in comfort.

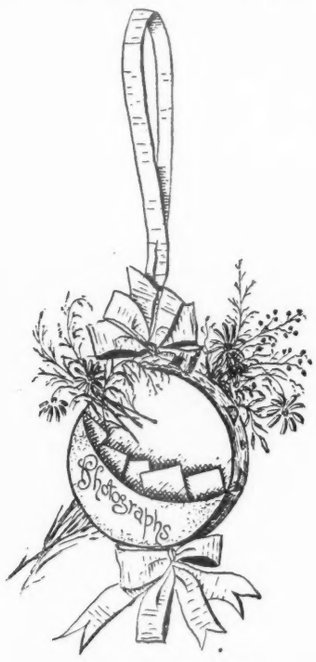
Washing-day Science.

MRS. J. N. MUNCEY.

Washing has many trials for the farmer's wife. The kitchen, on the average, is small and its uses are many. The duties of most of us are so numerous, that any easier way to do work is welcome if it can be well done. There are many methods now that the progressive housekeeper uses to lighten the labor of cleansing her clothes. Those given here are practices which are in actual use and have been of great service in lightening the labor of a farmer's wife.

Is there a philosophy of science in washing? There most assuredly is. Most of the dirt is held upon the wearing apparel by the oil from the body; some by being pressed in between the threads which compose the cloth. Any method which will free the fabric from the oil will loosen most of the dirt, and only the small portion between the threads needs to be loosened by rubbing. Cold water is the slowest thing in the world to take out grease, and the first rule in washing should be, "Don't use cold suds for cleansing dirty clothes." Soap is used as another aid in attacking and dissolving the grease. It is very poor economy to use an inferior grade, and waste your muscle in making up for its poverty. Melting the soap and stirring it in the hot water has proved much more satisfactory than rubbing it upon the soiled places. Clothes should not be allowed to become very dirty, as the fabric is often worn away more in the rubbing to get them clean than in the wear. If they were not worn so long, and consequently were less soiled, they would not require an expenditure of strength to clean them.

I have found this recipe for a washing fluid very helpful. Take five cents' worth of salts of tartar, and the same of ammonia powder, one box of concentrated lye, and one and one-half gallons of soft



FOR PHOTOGRAPHS.

water; boil and skim and set away in a cool place. The evening before you wash, heat enough water to soak the clothes, and if they are very dirty, use a cupful of the fluid; if not so soiled, half a cupful will answer. Most women who have used the recipe recommend the use of enough soap stirred into the soaking-water to make it soapy, but the original does not call for it. In the morning wring out the clothes and put them in the boiler in which half a cupful of the fluid and the usual amount of soap have been stirred. If you have clothes enough to fill the boiler several times, you will need more of the fluid. Half a cupful is enough for two boilers of clothes, if they are not very dirty. When they have boiled 20 minutes, take them out and rub through a soapy water, and then rinse well, being careful not to let the water get too soapy in either case. Overalls are especially hard to wash by the old way, but when dipped in the boiling water in the boiler, and taken out at once, they seldom refuse to become clean with a few rubs. The boiling water fades them no more than the excessive amount of rubbing they must have to make them clean if not boiled.

For Eyeglasses.

F. H. PERRY.

This cute little book is the latest thing out for those who wear eyeglasses. It has a kid, satin, silk or linen cover, lined with chamois, over an interlining of crinoline, inner chamois leaves, and

EYEGLASS CASE.

an embroidered, painted or gilded inscription, "Rub, Rub, Rub." The cover is an inch and three-quarters square; it is edged with a fine silk cord, secured by minute silk stitches, while a cord to match the cover is laced through tiny perforations at the back of the book; one end of the cord is left several inches long and is finished with a loop just large enough to slip over an ordinary dress button. To adjust this little convenience, slip the loop over a button or hook in the bosom of the dress and tuck the book inside, or beneath some fold or fulness, if a fancy corsage is worn.

A New Kind of Photograph Holder.

A tambourine, daintily trimmed with ribbon and artificial flowers, as shown in illustration, makes a decorative foundation for a photograph holder, to hang on the wall. A crescent-shaped piece of cardboard is fitted snugly in it to form the pocket. This is covered on one side with plush and on the other with silk, and glued in. Light green plush and ribbon are very pretty used with daisies and grasses. The flowers are kept in position by gluing them on the rim of the tambourine.

Convenient Shelves and Drawers.

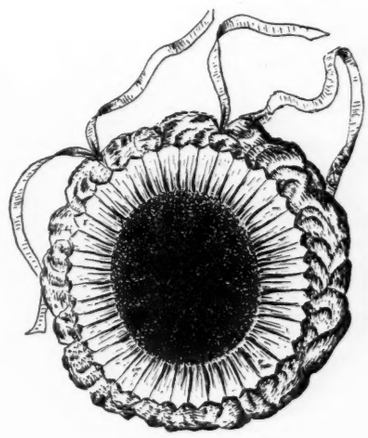
GORHAM SILVER.

The great secret of living comfortably is to render all household duties as light as possible, beginning with economy of time, by saving steps in the kitchen. I have recently made an effort in this direction, which, having proved successful, I would suggest to other housekeepers. My kitchen has two tables—one, the domestics' dining table, stands against the wall, and it is only necessary to raise the front drop-leaf to accommodate them. Above it, I have had two shelves put up on bronzed brackets, upon which are set plates, platters, cups and saucers, spoon holder, sugar bowl, milk pitcher, and a box of knives and forks—in fact, everything that must be used three times a day in setting the table, and a very pretty ornamental effect they have. A third shelf put up near the range holds a covered salt dish, a common tin pepper box, chopping knife, bread and cooking knives and iron spoons of various sizes suspended along the edge—articles that are used three times a day, and cannot be too handy. The shelves up and duly appointed, Honorah, my cook, who had just given me notice that she must find a place of fewer steps, threw up her hands with delight, "Faix, mum, but it's foin," she ejaculated, and withdrew her resignation. In the new order of things, the table is set in the twinkling of an eye. She has only to stand before the table and reach out, instead of unnecessarily tiring her legs and feet running to and from the dish closet.

In the other, the ironing table, I have had two deep, smooth running drawers inserted. As a rule, every ironing table has a shallow drawer that is of very little use; these of mine, however, are ten inches deep—the proper size for the purpose intended. One holds the laundry articles—ironing sheet, bosom board, wax bag, holders, flatiron standards, and cloths for dampening and rubbing starch from shirt bosoms and collars. There is also room to lay away any choice garment the laundress has forgotten to starch, which, left in its proper place, is not likely to be overlooked in the next washing. The other is the baking drawer—in it are cake dishes, bread and biscuit pans, pie plates, paste roller, spice box, essence bottles, baking powder—in fact, everything pertaining to pastry making. I find these drawers wonderfully convenient, saving untold steps and a great amount of time, which is the paramount economy in the executive management of a household. Only those who have personal oversight of the duties of a cook can estimate the number of steps she is obliged to take even in catering for a small family of simple habits. And only housewives who do their own work can appreciate the saving advantage of deep drawers and many shelves; and that useful and necessary articles in plain sight, kept clean and bright, are an ornament, rather than a defacement, to kitchen walls.

Head Rest.

The sunflower head rest, shown in the accompanying engraving, is very pretty and appropriate for a piazza chair. The round pillow has a puffing of brown India silk sewed around it, and the back is covered with the same. The center of the flower is made of brown plush sewed on the pillow; the petals, of yellow ribbon, are then sewed around



SUNFLOWER HEAD REST.

this, these being turned over, finished in a point, and sewed to the puffing. Pieces of the ribbon are sewed on the top to fasten it on the chair.

Country Frocks and Their Accessories.

In old-fashioned novels we always read of young ladies clad in the picturesque simplicity of white Swiss, or book muslin, and the realistic author of the summer of 1892 will also dress his heroines in airy, fairy-like fabrics, but they will be the sheer organdies and gossamer lawns, scattered over with bunches of such natural looking posies that they might have dropped from an artist's brush; or else a plain India muslin with a border embroidered in colors and elaborately trimmed with a profusion of lace and ribbons. Lined with silk, these are handsome enough for any occasion, though they are simply made with a bell skirt, round waist, and a girdle of double-faced moiré satin ribbon that forms a Felix bow at the back. This Felix bow, however, is quite a complicated affair, consisting of five loops and two long ends which fall to the bottom of the skirt. With it, two small butterfly bows are set on the shoulders.

Girdles, sashes and belts are quite a feature of the summer styles, made so by the multitude of blouse and shirt waists; while many of the pretty

bodice belts are truly "a joy forever." One of sparkling jet is the very thing to confine the Russian blouse of black lace mentioned last month, while others are of silk ribbon fastened by a gold clasp of elaborate workmanship. For tennis suits, striped silk belts with a clasp of filigree silver, are much liked, but there are many less expensive ones of leather having a pointed and laced bodice both back and front. For regular outing gowns, sashes are much in vogue, preferably the gay Roman sash with its gorgeous colored stripes relieved by black. This is wound in soft folds about the waist, and tied on the left side in one loop and two very long ends.

Those who are to spend part of the warm season at the seaside, will do well to choose a serge gown, either dark blue or the new Mephistopheles red that has a yellowish tint, made up with a yoke and foot band of tan-colored cloth. Alpacas, too, are excellent for seaside wear, and chic imported frocks are shown of this stiff, but serviceable, fabric in grays and browns made up over red, with a scarlet panel showing down the front laced across with red cords. White alpacas, also, are used for evening wear with a lining of striped or changeable silk revealed by slashes in skirt, yoke and sleeves.

At midsummer, too, the gay young maiden's fancy lightly turns to thoughts of outing gowns, and these in material and hue and in everything except length are far more sensible than they were last year. The general features of all suits that come under this category, whether for traveling, mountains or seashore, are a gored skirt of moderate-weight wool with a two-inch train, a jacket of the same material and a wash silk or satine shirt waist, a style that may be altered and trimmed to please the wearer.

A stylish model has the bell skirt, but with the back seam sloped less than for a walking gown so as to give more fullness at the top. It is untrimmed, but a ruffle of taffeta silk, pinked on the edge, is set under the bottom. The jacket is quite short, fitted in the back, and open in front with a flat turn-down collar that shows the high blouse collar at the back. The sleeve is in mutton-leg shape very close below the elbow, while the stylish flaring cuffs may be added, if desired. The shirt waist is gathered at the neck and shoulders on to a yoke lining, a strip of silk being stitched down each shoulder over the gathers. A drawing string is run in round the waist, and the full bishop sleeves are gathered into straight cuffs. The belt is of the dress material, laid in deep folds; and a wide silk necktie is knotted about the throat. Visor caps come again to wear with these costumes, but more chic are the Alpine hats of soft felt with creased crown and rolled sides. The canvas shoes for country use are more stylish in white, gray-brown and gray-green, the tans and russets having become very common. Red slippers and Oxfords are liked by many, but it is questionable whether they be good form outside of the house where they are extremely pretty.

It is said that laced walking boots are to supersede those with buttons. They have kid or figured cloth tops, vamps of calf, kid or patent leather, and very long tips. Oxford ties come in a variety of shapes and materials, kid, cloth, suede, and, above all, patent leather. Indeed, the last plays a part in nearly all the new foot gear. It may, then, be as well to say that in buying patent leather shoes one should be careful to get them sufficiently large, as they never stretch, and occasionally rub them with vaseline to prevent cracking. In packing, stuff the shoes with soft paper.

For full dress, satin slippers to match the evening gown in color, are the proper thing, but, if expense has to be considered, and the dancing shoes must do duty for some time, and with various costumes, black or gray ones will look well with anything.

Large white parasols of silk muslin decorated with bunches of white gauze ribbon, are charming for driving, quiet country walks and afternoons at the field club, of which most towns can now boast; but the useful, everyday affairs are of changeable silk, or plain gros grain with club sticks of polished wood, capped with silver or gold. Dainty hand-painted china handles are also shown, and some of ivory, etched in flowers and figures. Sun umbrellas are 24 or 26 inches in the gores, with plain black, brown, red or blue silk covering and twisted sticks of natural wood.

Taffeta gloves wear much better than those of pure silk, which are verily "a delusion and a snare," while they appear much better cut than formerly, having several buttons at the wrists, instead of drawing on in jersey style, and soon becoming loose and baggy.

July Jellies.

PALMETTA MONTCLAIR.

I should like to whisper this bit of advice into the ears of all city people: "Never visit your country friends in July." It is one of the hardest of all the hard summer months for the country housewife. Most of the small fruits, and some of the larger ones, must be jammed and jellied and preserved then, if ever.

"A workman is worthy of his tools," is as good a motto for a woman as it is for a man, and if she will provide herself with the necessary tools, her labor will be much lightened. These are, first, an oil stove, then a proper kettle, which is either porcelain-lined or of granite ware, the first named being preferable. There should be a jelly bag, and a holder for the same. This latter, if you are near any large house-furnishing store, can be purchased for a few cents; if you must improvise one, you may do as my mother used to do, turn a rush or wooden bottomed stool upside down, set an earthen bowl between the legs, place a square of cloth half wool and half cotton, wrung out of hot water, over the feet, leave a little depression in the center, and tie the cloth fast to the four feet; or you may make a pointed bag of it by sewing up two contiguous sides of the square, and fastening loops to the top, which can be put over the four feet of the stool. With all these conveniences, jelly-making becomes almost a pleasure, even on a hot July day, for you can take your stove and all the contrivances into some cool, outside kitchen, or even to the porch.

A wet summer generally means watery fruit, and extra care must then be taken, or the jelly will not "jell." Be sure that the fruit is picked rather under, than over ripe. The old-fashioned way of heating the fruit in a stone crock, set within a large boiler of water before mashing and straining, is laborious and unnecessary. Simply mash your fruit, whether it be strawberries, currants, raspberries, blackberries, or gooseberries, in an earthen dish, using a porcelain potato masher. Then strain it through a double thickness of cheese cloth also wrung out of hot water; this time you may squeeze with all your strength; then strain through a flannel bag, but do not squeeze, or it will not be clear.

Measure the juice, and for each pint weigh a pound of the best granulated sugar; put the latter in pie dishes and place in an oven where it will heat and not scorch; boil the juice 20 minutes from the time it begins to boil; turn in the sugar and stir until it is all dissolved, then fill the glasses as quickly as possible. To facilitate this process, have a basin of hot water ready, dip in each glass, and then stand it on two or three thicknesses of wet cloth. This will prevent cracking.

Now, in a dry summer and in certain latitudes, nothing more will be needed except to let the jelly stand 24 hours, and then cover with metal tops or thick paper, gummed on, but in some seasons, and in some climates, jellies will mold unless protected by a thin covering of paraffine. Melt a little, and pour a thin layer on the top after the jellies are cold. It forms a wax-like, air-tight covering, and when the jelly is about to be used, it can be lifted off by loosening with a penknife, wiped, and put away to be melted over next summer.

When one lives in the midst of a garden of small fruits, some delicious mixtures may be made. Raspberries and currants is an old-time mixture and hard to beat. Strawberry jelly is improved by the addition of one pint of currant juice to five of strawberry. Equal proportions of all the small fruits makes a curious jelly, and one as nice as it is curious. At a fair last summer some beautiful jellies were exhibited, one vertical half of the tumbler being pale amber, the other deepest ruby. This was made from red and white currant jelly. A partition of stiff letter paper was placed in the glass, and one kind of jelly poured in on each side. When the jelly became firm, the paper was removed.

Apple jelly is easy to make, and, if flavored with the juice of some small fruit, is exceedingly nice. The apples need only be wiped and sliced, then cooked in just enough water to keep from burning; when soft, throw into a jelly bag and let them drain without squeezing. Allow a pint of juice to a pound of sugar; cook as before. If you pare and core the apples, you may cook skins and cores first in a little water, then strain and cook the apples in this. After the juice has run out, a jam for immediate consumption can be made by rubbing the apples through a sieve, adding a cup of sugar to a pint of the purée and stirring for ten minutes over the fire.

Every mother wants a few glasses of spiced blackberry jelly for slight bowel troubles among the children. It is simply made by boiling a little bag of mixed spices, with the juice, in the proportion of one teaspoonful of cinnamon, half as much cloves and a quarter as much mace for each pint of juice.

Warm Weather Dishes.

For suppers and Sunday dinners, at least, we should be able to do without freshly-cooked hot meats. A corned beef's heart, which can be cooked during the Saturday baking, makes a nice Sunday dinner for hot weather. Get one that is perfectly fresh, and with a sharp knife trim the heavy muscles from the inside, washing it free also from clotted blood; rub well with salt, and put it in a good brine for a couple of days. Then wash it free from brine and put over the fire in cold water; simmer slowly two hours, add a small onion, some sprigs of parsley, a bit of mace, and a bay leaf with three whole cloves; cook for another hour, then set aside on the cellar floor to cool, leaving it in the liquor. Slice this thin, garnish with water cress or parsley, have some creamed potatoes and a dish of cold sliced tomatoes with cooked or fresh fruit in season, and you have an excellent dinner.

Cold roasted chicken, beef, veal, or mutton, when you are tired of eating it sliced, makes nice potted meats. Mince it fine and, for veal or chicken, you may add an ounce of ham to a pound of meat; after mincing, pound it with a porcelain potato masher, season with pepper, salt and nutmeg, and mix with four ounces of melted butter to each pound of minced meat. Pack into small jars, or cups, pressing down tightly, cover with a thin layer of melted butter; cover with paper, tie closely, and when wanted for use, slice thinly.

Lemon Jelly.—There is no nicer or more grateful dessert on a hot day than a cup of cold, hard lemon jelly. Cooper's gelatine is easier than the English preparations, and you need only follow the recipe on the outside of the box, except that you will probably need the juice of an additional lemon. When currants are in season, flavor with the currant juice. Use perhaps one lemon to each quart, and instead of using a quart of water, take half a pint of currant juice and three half-pints of water. Strawberries and raspberries may also be used.

There are a variety of desserts to be made from gelatine and different fruits. Boil a pound of sugar with half a pint of water until clear, then add a pound of pared, cored, and sliced apples, stewing until tender. Meantime, have half a box of gelatine soaking in sufficient cold water to just cover, when the apples are done add it to them, stir for a moment until dissolved, and press through a sieve; add the juice and grated rind of one lemon and beat until almost cold, when stir in the whipped whites of three eggs; continue beating until cold, pour into a mold, and set in a cold place until wanted. You may make a sauce like a soft custard with the yolks of the eggs and three gills of milk, or, better still, serve it with plain sweetened, or with whipped cream.

Currant Sponge. Cover half a box of gelatine with half a cup of cold water, soak half an hour and pour over it half a pint of boiling water; add a small cup of sugar, half a pint of currant juice and strain into a bowl; set this in a cold place and stir until cold and thick. It is best to do this in a cellar, or milk house; add the whites of four eggs whipped to a stiff froth, and turn into a mold. Use custard sauce or cream with it. Strawberries, blackberries, oranges, lemons, and raspberries, may all be used in the same way, adding more or less juice, and more or less sugar, according as the juice is of a very acid or mild flavor.

Gooseberry Fool is a nice hot weather dessert of English origin. Stew a quart of ripe berries in a pint of water until tender; mash through a sieve, add two ounces of butter, half a pound of sugar and the yolks of four eggs beaten light; beat smooth and turn into the dish in which it is to go to the table. Beat the whites of the eggs, adding gradually two tablespoonfuls of powdered sugar; when stiff, pile on top of the gooseberries and stand away to cool.

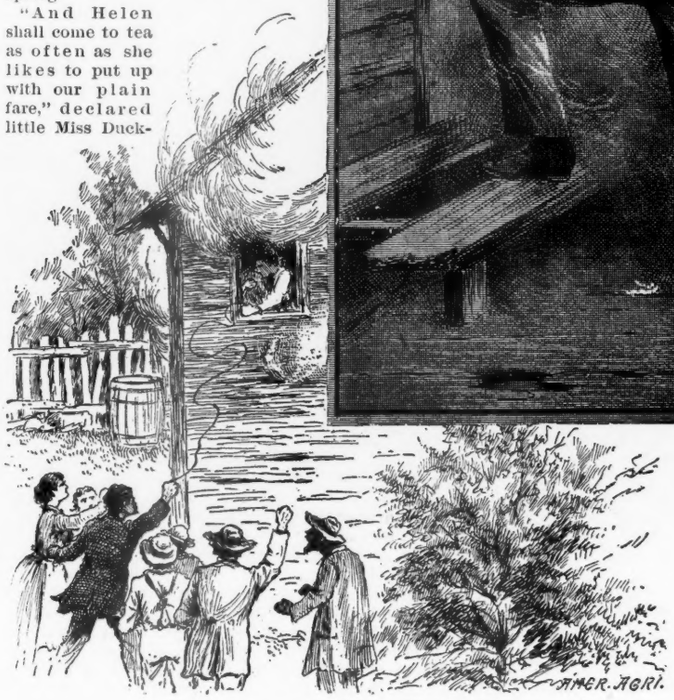
How the Hatchet was Buried.

OCTAVIA CARROLL.

A feud, as fierce as that betwixt the Montagues and Capulets had for several years raged between the boys of Valleytown and the country lads living on the breezy hills just above the small village. Originating in a feeling of jealousy, it waxed hotter and more bitter with every game of ball and every examination at the "Academy" where they were forced to meet the rival factions, tauntingly dubbing each other "Lilies of the Valley" and "Ground Moles," while if a Lily chanced to whip a Mole in a fair fight all the town-bred youths immediately stood on their heads for joy, and if a Mole went above a Lily in class, the entire hill company crowed as loudly as the chanticleers of the barnyard. By general consent two boys had come to be considered the leaders of the respective factions; handsome, quick-witted Roy Hastings of the former and strong, bright Carl Duckworth of the latter; while it was an annoyance to each that their sisters has struck up a "bosom friendship" and stubbornly refused to share in their brother's feud.

"It is so absurd in Roy," said Helen Hastings "to want me not to visit Maizie, whom I love so dearly, just because one of her family has beaten him at baseball and shot more pigeons this spring."

"And Helen shall come to tea as often as she likes to put up with our plain fare," declared little Miss Duckworth, "even if Carl does look like a thunder-cloud all supper time and has hardly enough politeness to pass the butter."



HE CAUGHT THE ROPE THROWN TO HIM.

So matters stood when, one evening in early June, the commander of the heights' coterie summoned his followers to a meeting in the loft of an old barn on his father's estate, that was only used as a storehouse since a better one had been built.

"Hello, fellows, what is this pow-wow about?" asked agile Mark Tripp, as he sprang up a rickety ladder and popped his head through the square opening in the attic floor.

"Dun 'no, some bee, Duckworth, here, has buzzing round in his bonnet" replied lazy Hugh Blossom from the hay, where he reclined. "It takes the captain to have 'happy thoughts'" while, playfully pulling a refractory lock of hair sticking out from Carl's head, he gaily chanted,—

"And the duck with the feather curled over his back,
He leads all the others, with his quack! quack! quack!"

"Good enough! All right, Ducky, proceed with your quacking! Let's know what's up! Are the 'low-ly lil-i's of the val-l'y' once more on the war path? And, to what do they challenge us—a spelling match or a swimming race?"

"To neither. Those very superior posies are about to seek glory in another way. I have learned from a most reliable source, that they are now hoarding all their pocket money in order to astonish the natives. In fact, fellers, they intend to fresco Valleytown a decided carmine on the 'Glorious Fourth' and we have got to make the hills hum to quench 'em."

"What form is their celebration to take?" asked little Peter Wheatly

"Fireworks, principally. Real stunners! Not just a few Roman candles and sky-rockets, but flower-pots throwing up colored balls that burst into stars, zig-zagging serpents and all sorts of things, such as have never been seen round here before. Why, our big bonfire and giant crackers will be nowhere."

"Right you are there, Cap," said Hugh. "They will have all the county down on the Green patting them on the back for their public spirit, while we occupy a back seat. It's a pretty bright move for the Lilies and I don't see how we can prevent it."

"Get up a counter-attraction. Pyro—pyro—what do you call 'em will make a good deal finer show from Round Knob than down yonder in the dale."

"OH CARL, HELEN IS THERE!"

"Sure. But where are your pyrotechnics to come from?"

"From the city of course. See here, I wrote to a firm there as soon as I learned the Lilies' secret and they sent me a price-list." Young Duckworth produced a very gay red and yellow circular, but the boys only looked at each other in blank amazement. The hillside farmers were nearly all land poor, gaining but a bare subsistence out of the rocky New England soil and seldom had a dime, much less dollars, to squander on mere amusement.

"Guess you think we are Rothschilds or Vanderbilts," snickered small Peter.

"Pennies always burn a hole in my pocket and drop right out," said Mark.

"I might chip in a copper cent and a nickel with a dig in it," drawled Hugh, and there was no one else who could do better.

"Well, I know you are an impecunious lot," continued Carl, "but next week the strawberries will be dead ripe. If you fellows will only be patriotic and pitch in and pick for the cause we can put Roy Hastings and his top-lofty crowd to the blush, by getting up a really respectable show with a "piece" as a topper off. I don't believe the Valleyites ever thought of a 'piece.'"

"What sort of a piece?" asked Bud Perkins.

"Why, a fancy piece of fireworks of course. Just listen to what Powder & Co. offer!" and Carl read aloud—"'Realistic spectacle of Mother Goose, in peaked hat and scarlet cloak, with her gander by her side. The head of George Washington, the Father of his Country, surrounded by thirteen stars. Very fine. Superb figure of Christopher Columbus landing from his Spanish galleon upon the American shore. One of our most magnificent designs.'

"There, don't that sound prime? They're expensive, awfully expensive, but we can economize on the rockets and little things to come out strong, in a blaze of glory, at the end. I warrant a Mother Goose or, better yet, a Washington would shut up the Lilies' leaves in a jiffy."

CARL REACHES THE WINDOW.

"Or Christopher Columbus, I vote for old Chris," shouted Mark.

"Yes, yes, Chris and his galleon," chorused the others.

"It is the dearest of them all," remarked Carl somewhat dubiously.

"No matter, 'Chris or nothing,' say we." So it was decided, and before the boys parted they had all agreed, if they could win their parents' consent, to hire out for the berry-picking and to contribute every cent thus earned toward the Fourth of July celebration.

There is no spur like competition, and for the next three weeks the ambitious youths devoted themselves heart, and soul, and fingers to the cause; but the pickers had their reward, when, the berry harvest over, they found they could send a tolerably satisfactory order to Powder & Co., and when, on the third of July, a great box arrived by express, was unpacked, and its contents secretly, and under the cover of night, stored away in the lower part of Farmer Duckworth's discarded barn, their exuberant delight burst forth in sundry ecstatic somersaults and Indian-like dances.

It may be, however, that their exultation might have been tempered with caution had they been aware of two figures gliding stealthily through the darkness without, and known that the case, bearing the name of the city firm, when it was taken from the train had not escaped the sharp eyes of Roy Hastings and his chum Ed. Spafford.

"How do you suppose they ever raised the money to buy all those fireworks?" asked one shadow of another shadow, as they flitted down the hill.

"I don't know, confound 'em! But I do know their show is better than ours and something has got to be done!"

"Yes, indeed, and surely, Roy, there must be some way!"

"There always is where there is a will and—and —*matches*."

Boom, boom, boom! Old Captain Stone's ancient cannon announced the advent of another Independence Day shortly after midnignt, and Young America was quickly abroad with the Chinese cracker and torpedo.

Helen Hastings disliked the deafening racket of the village and, therefore, early beat a retreat to the hills, determined to enjoy the day in her own fashion with Maizie who welcomed her with open arms.

"I am so glad you have come, Nell, dear, for I was feeling as blue as your sash, if it is the Fourth of July!"

"Why, darling, what is the matter?"

"Oh, I am so worried because pa is worried. He don't act a bit like his dear, jolly, old self, but goes round with a long face and can neither eat nor sleep. Ma says it is because a mortgage or something is coming due and the crops have been so bad for several years that he is afraid he may have to sell the farm and move out West. It would just break my heart to leave this place."

"So it would mine. But there, Maizie, it is foolish to be troubled about what may never happen. It is so warm, let us find a nice cool spot and finish the book we commenced the other day."

"There is a good current of air through the loft of the old barn. We will go there if you can scramble up the ladder."

This, with some assistance, Helen succeeded in doing and the two girls were soon nestling in the sweet, new-mown hay.

"Eleven o'clock," announced Helen, consulting her little chatelaine watch as they finally laid down the entertaining story they had been reading, "and I am both sleepy and thirsty."

"Well, my dear, lie back and take a nap and I will go and make lemonade for us both."

"Really? Oh, that will be delicious!" and throwing herself back on the fragrant mow she closed her eyes as her blithe, hospitable friend skipped off toward the house.

The twittering of the swallows in the eaves and the hum of the insects in the meadows without were curiously soothing and the fair maid fell into a light doze from which, however, she was rudely awakened by a terrific explosion. She sprang to her feet in alarm to find the floor heaving like the deck of a ship at sea and feel the tumble-down building rocking as though shaken to its very foundation.

"What has happened! Is it an earthquake?" she gasped, rushing to the ladder-way; but she started back in affright at sight of a mass of flame and flying, fiery objects below. "Oh, this is terrible!" Was she, Helen Hastings—her father's pride, her brothers' pet—to meet a violent death here in this lonely spot? Expecting every instant to have the boards give way beneath her, she flew to the window and, in her desperation, would have leaped out, regardless of a huge pile of stones beneath, had not the voice of Maizie, at that moment reached her ear, calling: Don't jump, Helen; don't jump! You will be killed! Wait, courage! I am going for help." Even as she faltered hesitating, her strength failed, her senses reeled and she fell fainting to the ground.

Across lots from Round Knob, where they had been preparing for the evening exhibition, came Carl Duckworth, Hugh Blossom and Bud Perkins. They were in high spirits, discussing with animation the anticipated fun, when Bud suddenly stopped short, asking, "Who are those fellows making tracks so fast down the road?"

"Looks like Roy Hastings and Ed. Spafford," replied Hugh. "Though what brings them this way on such a day as this, puzzles me."

"I hope they haven't got wind of our plans and been up to some mischief," said Carl, uneasily, instinctively quickening his footsteps.

A moment later, as they entered the farm gate, the explosion that awakened Helen made them, also, start and gaze at each other in dismay. Then a howl of mingled rage, grief and astonishment burst from the trio as through the open door of the old barn shot a confused medley of rockets, pin-wheels, snakes and grasshoppers, popping and fizzing madly in the garish sunlight; a howl that culminated in a shriek when, whirling and spinning, out whizzed the famous "piece" the Landing of Columbus, thrown by the concussion far upon the grass, where it went off in a highly erratic manner, poor Christopher appearing perfectly demoralized as he stood on his head in the brilliant galleon with his feet waving amidst a galaxy of stars.

"All our three weeks' labor and all our money gone up in smoke!" groaned Bud flinging himself down in an agony of despair.

"And it is Roy Hastings's mean, dastardly work," growled Hugh; while Carl turned pale with wrath and shook his fist in a way that boded no good to his enemy. Indeed, at that instant, he felt that revenge, swift and telling, would be the sweetest thing in life.

Truly, then, it seemed the very irony of Fate, when, from amidst the wreaths of smoke pouring from the upper loft window, emerged for a brief second, a girlish, white-robed figure, with beseeching, outstretched hands, that paused, swayed, then fell back and disappeared, while Maizie rushed toward them crying, "Oh, Carl, Carl! The old barn is on fire and Helen is in there!"

"What! Roy Hastings' sister!" and Hugh actually laughed aloud.

"Serves the mean rascal right, too, if she was killed, for he would have no one but himself to blame," said Bud Perkins, whose bark was always worse than his bite, and who was really as kind-hearted a chap as ever lived.

"Oh, you bad, cruel boys!" exclaimed Maizie; but Carl, I know will not be so wicked," and she turned imploringly to her brother, in whose mind a fierce struggle was going on. In a flash, he saw his foe bowed and crushed with remorse, a "paying back" far beyond anything he could have dreamed of! Beside the risk was tremendous and why should he endanger his life? But, the next moment humanity triumphed, and shouting, "We can't stand idle and see a girl perish before our eyes! So here goes;" he sped off toward the burning building, stripping off his jacket, as he ran, which he plunged into a barrel of water and then wrapped closely about his head. Thus protected, he bravely dashed through, the flames lapping at him with their fiery tongues. His breath came in short quick pants, he was nearly suffocated, and falling rafters warned him that he had no time to spare. Valiantly, however, he struggled to the already-charred ladder and groped his way up it, until, gasping and exhausted, he reached the window with the unconscious girl in his arms, as the fire was eating through the floor at his feet.

To the anxious watchers outside, it appeared an eternity before the lad reached the window and deftly caught the rope they had ready to toss to him. With trembling fingers, he knotted this about Helen's waist, gently let her down into the arms of Bud and Hugh and then prepared to descend himself, when a groan of horror from the onlookers rent the air; there was a quiver, a sudden giving way, a deafening crash and roar. The flooring had at length succumbed to the destroying element and gone down. Mrs. Duckworth sank on her knees sobbing, "Oh, my boy! my boy!" and Maizie hid her face. But, as the smoke cleared away, the groan changed to a joyous shout and all looked up to behold the youth clinging to the casement which was still upheld by two feeble supports.

Hugh sprang forward. "Carl, Drop! Let yourself drop," he called. "We will catch you," and Carl, as a great darkness overwhelmed him, dropped like a dead weight and was borne, a begrimed and senseless burden, to his own little room in the cozy old homestead.

Summer was over, ere a mere wraith of sturdy, lively Carl Duckworth was able to creep down stairs to sit on the veranda and gaze listlessly out upon the mountain landscape in its early autumn dress. But, after weary weeks of pain and anxiety, he was on the mend and there was something of the old merriment in his laugh when he caught sight of a row of urchins, perched on the fence like a motley flock of birds, singing with hearty good will, "See, the Conquering Hero Comes!" and he was surprised to recognize in the welcoming choristers many "Lilies" of Valleytown, as well as his own familiar friends.

It was something of an astonisment, too, to have Roy Hastings hurry forward to offer his hand and say, "I can't tell you, Duckworth, how glad I am to see you out again and only wish you would give me a good, sound kicking"; while surely there were tears in his eyes and a curious break in his voice.

It was a boy's way of begging pardon but, being a boy, Carl understood, while as he looked into the other's white worn face so changed since he saw it last, he dimly comprehended that there might be "coals of fire" which burn more sharply even than the blisters and stings that had caused him such days and nights of agony.

So the grasp he gave Roy was warm and cordial as he said, "Well, I'm not equal to much kicking yet, old fellow; but, for one, I am tired of this old feud and think it is time we buried the hatchet."

"Oh, I am so glad!" cried a merry voice in the doorway and out danced Helen with her hands full of flowers. "You dear, heroic Carl. I have come to thank you, too, though I never, never can, for rescuing me on that dreadful day and, as some small return, they have let me be the first to tell you of the silver lining hidden behind that cloud of smoke."

"What do you mean?" asked Carl, thoroughly mystified.

"I mean that Christopher Columbus and his combustible companions did a pretty good turn after all. They plowed up the ground under the old barn so well that when the rubbish was cleared away there came to light what promises to be the finest paint mine in the whole country."

"Paint mine!"

"Yes, sir. Non-inflammable, mineral paint that will not only save the farm but, perhaps, make all our fortunes."

"It's true, Carl, every word true," laughed Maizie, who had stolen softly up, "Papa has had the ore analysed and is so happy he beams like a full moon. Judge Hastings, too, has been so kind, advancing funds, getting up a company and preparing to build a kiln. It has been quite the excitement of the summer in Valleytown."

"Well, well! This is glorious news! Hip, hip, hooray!" a feeble cheer that was echoed and reechoed by the faction on the fence.

"Dear me, haven't you finished your revelations yet?" exclaimed Mark Tripp suddenly tumbling up the steps. "For, if you have, the 'Lilies of the Valley' request the captain of the 'Ground Moles' and the young ladies to occupy the piazza chairs and witness a pyrotechnical display postponed from the Fourth of July but now given in honor of the recovery of our esteemed citizen, Carl Duckworth and of our Peace Jubilee."

All laughed at Mark's pompous little speech and hastened to take their places. So at last, in a shower of golden sparks, they buried the hatchet and the feud betwixt Valleytown and Hillside ended forever.

Washington and His Sheep.

A. J. BOWDEN.

In the summer of 1794, Henry Wansey, "a Wiltshire clothier," determined to take a trip to

America in order to see the country, with whose troubles he sympathized so much. During the course of his travels here, he went to Philadelphia, where he was introduced to General Washington. Perhaps the most pleasing part of Wansey's account of his travels, which was published in 1796, is that portion devoted to particulars of his interviews with Washington. That the father of his country took an interest in the production of woolens, may be inferred from the following conversation:

"The General asked me what I thought of their wool? I informed him that I had seen some very good and fine in Hartford in Connecticut, which they told me came from Georgia, but that, in general, it was very indifferent; yet from the appearance of it, I was convinced it was capable of great improvement; that, to my surprise in the course of traveling 250 miles from Boston hither, I had not seen any flock of more than 20 or 30 sheep, and but few of these; from whence I concluded there was no great quantity grown in the States, so as to answer any great purposes for manufacture. His excellency observed, that from his own experience, he believed it capable of great improvement, for he had been trying some experiments with his own flocks (at Mount Vernon); that by attending to breed and pasturage, he had so far improved his fleeces as to have increased them from two to six pounds apiece; but that, since, from a multiplicity of other objects to attend to, they had, by being neglected, gone back to half their weight, being now scarcely three pounds. I took this opportunity to offer him one of my publications on the "Encouragement of Wool," which he seemed, with pleasure, to receive.

"Mrs. Washington, herself, made tea and coffee for us. On the table were two small plates of sliced tongue, dry toast, bread and butter, etc., but no broiled fish, as is the general custom. Miss Custis, her granddaughter, a very pleasing young lady of about sixteen, sat next to her and her brother George Washington Custis, about two years older than herself. There was but little appearance of form. One servant, only, attended, who had no livery. A silver urn, for hot water, was the only article of expense on the table. She appears something older than the President, though I understand they were both born in the same year; short in stature, rather robust; very plain in her dress, wearing a very plain cap, with her grey hair closely turned up under it."

This is a very pretty picture, indeed, and graphically painted. It is little wonder that the General was unable to devote time to the Mount Vernon sheep, in the midst of his political career. The wonder is how he found time even to discuss them with a mere stranger.

The Little Runaways.

MARGARET WILSON.

Winnie and Marion were running away. They had good reason they thought. Had they not been called in from an archery match with the boys to mind Baby? And then, had they not been scolded for being cross to him? A few muttered whisperings while the little fellow was falling asleep had decided it all.

"I wish we had thought to put some crackers in our pockets before we started," said Marion, before they were out of sight of the house. "I begin to feel hungry already."

"O, we'll find berries and things in the woods," said Winnie brightly. The day was beautiful and she began to think running away good fun.

"Berries, Winnie?" queried Marion, the doubter. "I looked all over the strawberry patch, yesterday, and not one was ripe. And what other things are there in the woods that are good to eat?"

"Well, there's—" Winnie had to pause; "There's birch bark for one thing. Chewing-birch, you know."

"O, yes, so there is," assented Marion, reassured. She was fond of chewing-birch.

"And sour sorrel," Winnie proceeded, "and grape tendrils and young raspberry shoots. Why, if it comes to the worst, we needn't starve where there are dandelion leaves."

They had reached the foot of the hill now, and a swampy piece of ground had to be crossed. This gave an opportunity for what they called "navigating," a pastime of which they were fond, but one which always resulted in wet feet. A little shriek soon announced that in jumping from one island to another—the small clumps of grass were "islands" to these young navigators—Marion had miscalculated her distance, and was standing ankle deep in water. Winnie had to change her course and go to the rescue, and in reaching out to help Winnie to dry land she also got one foot into the water. Such adventures made the delight and excitement of navigating. In the pasture was a high and dry ridge of land, and when they got this far they sat down, took off their boots and stockings and spread them out in the sun to dry.

"It seems a long time since we left home," said Marion. "I suppose it's about lunch time.

"They won't be thinking much of lunch," said Winnie, a note of triumph in her voice. "They will be searching everywhere for us by this time, and they will almost have given up hope of ever seeing us again. They'll wish they had been better to us."

"I shouldn't wonder if Jack was sorry for calling me a crybaby, yesterday," reflected Marion.

A SWAMPY PIECE OF GROUND TO BE CROSSED.

"I wish I had written a will," said Winnie, turning the stockings, "and left my Robinson Crusoe to Maurice. He always said that Aunt Eleanor should have given it to him, because it wasn't a book for a girl."

"Are they nearly dry yet?" asked Marion. "I'd like to go on and find some chewing-birch. I *wish* we had put some crackers in our pockets. I'll never run away again without something to eat."

"Are you very hungry, dear?" asked Winnie, pityingly. "Well, these are as dry and warm as toast, now. Put them on and we'll go and look for berries. I know the earliest spot in the whole place for them. I never told any one before, because I like to get the first one for Mamma myself. You shall have all that we find; so cheer up."

Boots and stockings on, Winnie led the way to a little knoll around an old stump. Here a diligent search began, and for ten minutes not a word was said.

"I'm afraid there are none," Marion said at last, but next minute gave a little cry of delight. "O, here's a great, great big one, as red as fire. Look, Winnie! Let us hurry and bring it to Mamma."

"*What* a beauty!" exclaimed Winnie. "Come on."

The first strawberry was the great event of each season, and in the excitement of the moment they forgot that it was not to seek it they had started out that morning. They were half way across the swamp before their original purpose came to mind again. Winnie was selecting an island for her next jump when Marion called out,

"But, Winnie, we didn't mean to go back at all."

She stood still.

"Neither we did. Now that we are this far, though, perhaps we had better go the rest of the way."

"Yes, for how would Mamma get the first strawberry if we didn't bring it to her?"

When they came near the house, a feeling of guilt caused their steps to lag. They watched anxiously for the first signs of the disturbance caused by their absence. Surely, they said that couldn't be Maurice and Jack still at their bows and arrows. Winnie seized Marion's hand firmly and hurried her into the house. Their mother met them in the hall with her usual smile.

"Have you been out for a walk!" she asked. Marion ran and kissed her.

"Here, Mamma; it's for you," she said, opening her hand, and disclosing a crushed strawberry. "The first one!"

"Would you like me to mind Baby for you?" Winnie asked, holding out her arms for him.

"No, dear. Lunch is just ready. There is the bell."

Marion gave a rapturous sigh.

"I'm so glad we came back," she said softly to Winnie.

Our Puzzle Contest.

We give below the winners in the prize contest for April, which was repeated from the January number, on account of the short time allowed for answers to be sent in. We know the puzzles were very hard, but the first prize, a Warwick bicycle, was worth a lot of hard work, and from the number of answers received, we judge that a great many of our contestants wanted the first prize. This is one of the leading high-grade bicycles and is made by the Warwick Cycle Manufacturing Co., Springfield, Mass., who will send their fine catalogue free to all applicants. Our puzzles will be resumed in the September number, when a series of novel ones will begin that are destined to be very popular.

ANSWERS TO THE APRIL PUZZLES.

1. It will take fewer horses to draw bigger loads.

   If you only insist upon having good roads.

2. You can save taxes by making and maintaining better roads.
3. Warwick bicycle.
4. Good roads save taxes.
5. Good roads now.

THE PRIZE WINNERS FOR APRIL.

First prize, Freeman C. Goffe, New Rochelle, N. Y.

Second prize, Mrs. Julian Hawthorn, Sag Harbor, N. Y.

Third prize, Wm. S. Dalrymple, 815 E. 138 street, New York city.

Fourth prize, Harry J. Bean, Box 864, San Jose, Cal.

Fifth prize, William Dinwiddie, Greenwood Depot, Va.

Prizes worth one dollar to each of these twenty-five names: David Cronyn, Bernardston, Mass. Lewis B. Wheeler, Berlin, Mass. C. W. Frazier, 50 Mall street, Lynn, Mass. Ambrose B. Mason, Box 200, Warren, R. I. Florence M. Dale, Iowa Falls, Ia. Jno. B. Grant, 108 Duane street, New York city. M. H. Goodier, Cedar Lake, N. Y. Mrs. G. F. Hubbard, 1210 Harmon Place, Minneapolis, Minn. W. F. Scheele, New Orleans, La. Franklyn Bradley, Northville, Mich. James R. Beede, Rockford, Minn. Mrs. E. B. Sage, Nichols Farms, Ct. Mrs. Jennie Reynolds, Canton, Me. Margaret Lee, Mitchell, Ind. C. Eugene Ludden, Canton Point, Me. Sarah H. Hammer, Swampscott, Mass. A. M. Bridgman, Box 552, Brockton, Mass. David Hinrod, Sterling, Kan. Will. R. Sperry, Oxford, N. Y. Mrs. John Evans, Tangipahoa, La. E. G. Kirstein, Ashville, N. C. Marion S. Ross, Bolliver, Mo. E. A. Deckbar, 411 Laurel street, New Orleans, La. Edward Jackson, Winchester, Md. Charles K. Bates, Fairhaven, Vt.

If any one's address is not correctly given in this list write immediately to the "Puzzle Editor" and have it corrected before the prizes are sent out, for they will go to the addresses given, on the 25th of June.

Norman Agriculture.

The agricultural and manufacturing industries of Northern France plainly indicate the peculiar characteristic perseverance and painstaking habits of the French, nowhere equaled throughout the world. The English would never have made the beet-sugar industry a success under the manifold discouragements impeding every step of the industry from the beginning to the present time. The French have made it a grand success, and so indeed, have the Germans, but, notably, only these two nationalities. The world at large, can learn a valuable lesson from the great manufacturing establishments of Normandy. Nowhere else are the operatives better paid, better fed, better housed, or more humanely cared for by the manufacturers than in Normandy. In every agricultural and manufacturing industry, save two, Normandy can be indicated as a worthy exemplar. The two defective ones are the wine and cider making. The most common methods in America, of cider and wine making, are transcendantly superior. The cider and wine is made in the most primitive manner. The apple trees are hoary with age, and covered to the remotest branches with a gray moss, indicative of a sickly old age and premature decay. The apples, of course, are small, rough, rusty and insipid. The vines and grapes are but little better. Neither the cider nor wine show the customary care bestowed upon the fruit and wine in other sections of France. Good wine, or good cider, can never be produced from unsound, unripe, uncultivated, unclean, or imperfect fruit. Everywhere throughout the North of France are seen the friendly relations of agriculture, as shown by the mixed tastes of the English and French. The horses, cattle, sheep and even dogs are cherished alike in both countries. The interchange seems mutual. The bull dog and poodle are as good friends in France as in England.

H. ERICUS, Rouen, France.

Arable Farming in Victoria.

There is at present very little system in the farm operations of the colony of Victoria, and few practice mixed husbandry. Some districts of the colony are from four to five weeks earlier than others. During the month of January harvesting operations absorb attention. In wheat areas, those devoted entirely to grain growing, little is done in the way of manuring. Sheep are utilized only in clearing up the weeds and grasses among the stubbles and, after they have taken all they can, the straw is burned. In the cool and late districts attempts are made to secure autumn and winter feed; maize, rape, Calcutta oats, Cape barley, mangels and carrots being sown. In February the harvest rush is over. In dry seasons when the ground may be too hard for plowing, scarifying may be employed. During the month, if it be not a very dry one, maize, sorghum and millet may be sown. When land is not too hard farmers begin plowing for the wheat crop, but as they have generally to cart their grain to market during this month, it is difficult to get the plowing forward. In March, the inland farmers are frequently hindered for want of rain; in the coast districts, however, preparations for sowing are made. Insufficiency of moisture is felt most in April. In the warm districts it is the best time to lay down lucern. Signs of winter appear in May and in all, except the late coast districts, sowing of wheat will be finished. May is also the month when rotation grasses and peas are sown. In June the sowing of cereals will be well forward; in dry localities wheat sowing should be completed. In ordinary seasons the cereal crops are showing well above the ground in July, and if land has been soaked, the feeding-off wheats may be done. Operations for August will depend to a great extent upon the locality and character of the season. Potato planting will be getting forward in the early districts. The month of September is generally a critical one in the inland districts; the wheat crops are frequently in need of rain. Potato planting will also be pushed forward in both late and early districts. During the month of October the crops are generally still in an unsafe condition. If September has been dry, rain is looked for to save the crops. Summer fallows are almost universal. Ere the month closes the early hay crop will have been cut and stacked. Harvesting the hay and grain crops begins in November; the season is generally a "catching" one and there is a possibility of danger from bush fires. In December harvesting is the general occupation—reaping, stripping, threshing and winnowing. An American authority says of our implements and tools: "They are very different from what we use in America. Some of yours are much better than we have in America. Your plows and scarifiers are better in construction, more ingenious in design, and of very superior quality of metal to what we have in use. Other tools, your harrows and many other implements I could mention, I think are primitive in the first sense of the word."

The wheat grown in Victoria is the finest in the world and brings the highest price in the London market, and is the crop first sown by the new settler. Oats grow well in the coast districts and in the more moist of the inland districts; with good cultivation, from 40 to 50 and up to 60 and 70 bushels per acre are obtained. Barley gives good returns all over the coast, half of the colony and on about half of the inland area; although crops of 100 bushels per acre are obtained, the maize crop is not understood by Victorian farmers. The potato crop has been cultivated in most of the coast districts, and it yields a higher return than cereals. Hay is extensively grown and is made from oats or wheat, cut just before ripening. The yield in the coast districts is about four tons per acre, and two tons in the inland.

D. E. MARTIN, Secretary for Agriculture,
Victoria, Australia.

How They Till the Soil in India.

The India farmer has scarcely any tools, and those he has are of the simplest kind. By a very crude implement, which can scarcely be called a plow, the land is easily rooted up. This plow consists of a triangular piece of wood about 18 inches in length and six inches in diameter at the larger end, the other end being pointed. On the flat side of this bit of wood a groove is made, into which a flat piece of iron, a foot in length, an inch wide, and half an inch thick, is inserted and held in its place by a staple. The staple underneath does not interfere with the rooting. This iron bar, which is pointed, serves as a nose or point to the plow. The triangular bit of wood is morticed into an upright stick, the latter about four feet in length, at the top of which is a wooden pin on the front side, which is for a handle. About 18 inches from the ground, a strip of board four inches wide, an inch and a half thick and eight feet long is inserted into the upright stick and serves as a beam and pole. The yoke is a straight stick six feet long, three inches in diameter, with four wooden pins, each six inches long, one on each side of the neck of the bullocks. A small hemp rope, or grass twine, goes under the bullocks' necks to keep the yoke in its place. The beam of the plow has a few notches or catches under it near the end and is fastened to the yoke by a small grass rope or twine. The plow makes no furrow, but simply roots or tears up the soil, and the plowman, with his little goad or whip in one hand, the other holding the wooden pin in the upright stalk, walks by the side of the plow.

The cattle are of the Brahmini kind, white, slender-bodied, long-legged, and about half or one-third the weight of oxen in the United States. They are very lean, as about the only feed they get for some months before the rains, and during the plowing season, is bhoosa or wheat straw and chaff. To see a man, weighing less than 100 pounds, with only a strip of cloth around his loins and a like strip about his head, driving a pair of little lean cattle, swinging his whip and dodging from side to side of his plow and calling his bulls by the endearing name of "my daughters," seems a sight, especially when first observed by an American farmer. Plowing is hard work, both for the little cattle and the man himself, particularly if the ground is hard and baked, and if it is the first plowing. The best a plowman can do is to tear up about half an acre a day, and then the work is poorly done. The land has to be plowed in this way a number of times, especially for the more substantial crops.

A pair of cattle cost from $5 to $20, but the average price of these working cattle in the Northwest provinces is about $10 a pair. The average cost of a plow is 40 cents. The only other implement used is a log, or slab of wood, six or eight feet long, drawn sideways across the field, by one or two pairs of cattle to crush the clods, or smooth the surface. After the soil is well pulverized, the last plowing takes place, when a man dribbles the seed from his hand into the furrow, or mark, after the plow.

I. L. HAUSER, Bareilly, India.

No Wornout Land.

The efficacy of thorough cultivation combined with the use of fertilizers has been well illustrated upon a small piece of land that came under my control three years ago. It is a heavy clay, and forms part of a tract that the neighbors told me was worn out 20 years since. I was told that any labor expended would be thrown away, as nothing would grow there. But I was credulous. I am an unbeliever in wornout land. I had it plowed, and this not putting it in satisfactory shape, it was dug over thoroughly with a fork. Peas, potatoes, corn and some other vegetables were planted upon it; they were fertilized at planting time and once or twice during the period of growth, with a "complete" potato fertilizer, and were given frequent and shallow cultivation. The season was a wet one which probably made the fertilizer more effective, but the way everything grew was a surprise. I never before had peas to equal those, either in size, yield, or quality. The corn grew luxuriantly, and eared enormously. The potatoes were large, and of excellent quality, which latter fact was somewhat of a surprise to me, as the soil was not of a kind to produce a good quality of potatoes. The wet season and the heavy land caused them to rot badly, however, but the point is that they grew on that wornout soil on which nothing had been grown for 20 years. The same soil during the two seasons since, has given excellent crops of peas, corn, tomatoes, beans, etc., simply with thorough cultivation and light dressings of commercial fertilizer and hen manure.

F. H. VALENTINE, Union Co., N. J.

Depreciation in the Value of Farms.

The statement that farming lands have depreciated in value from 50 to 75 per cent. during the past 20 years, is true only if we assume that the valuation of 20 years ago corresponded with the real value of the land. At the close of the war, when gold was at a premium, when butter sold at 50 cents a pound, pork at from 15 to 18, eggs at 40 cents a dozen, and other farm products in like proportion there was a grand rush for farms. The demand so far exceeded the supply that ordinary farms often sold for $100 an acre. Very few farms could be made to pay for themselves at such prices, and a reaction commenced. The supply of farm products increased, and as the price decreased the profits of their production decreased. Our national government opened to settlement the vast reserves of land in the West, and capitalists built systems of railroads which place the Iowa farmer nearly on a level with his Vermont competitor so far as markets and prices are concerned. In consequence, the value of Eastern land must decrease until its value corresponds with its productive capacity. This apparent depreciation of farm lands is only necessary return to its real value, as measured by the price of its products and its productive capacity, and becomes hurtful to the interests of the State only by the futile efforts of landowners to keep its price up to its former valuation. CHARLES ORMSBEE, Washington Co., Vt.

From South Dakota.

Immigrants are again turning South Dakotaward, as no other State can offer cheaper and better agricultural lands. The Sisseton Indian reservation, opened to settlement this spring, was settled with a rush. Hundreds of settlers, for days prior to the date of opening, surrounded the reservation, eager to be first, but were kept out by government troops until 12 o'clock, noon. The fifteen hundred Indians on the reservation, having selected their lands in severalty, left much choice farming and grazing lands, for which intending settlers made such a scrabble. This spring has been very late, cold and backward, seeding in the northern part of the State not being completed by the middle of May, which is something unprecedented. There is more moisture in the ground now than has been at any time during the last ten years; consequently, farmers feel sure of an enormous crop. Fine blooded cattle, sheep, imported

Percheron, Clyde, Shire and Cleveland Bay coach stallions are found in every county in the State, which is evidence that we have a good stock country and enterprising citizens.

GEO. HICKMAN, McPherson Co., S. D.

Homesteading in Washington.

The settler on government land in the western part of the State of Washington cannot expect a crop the first year. The unvarying forest must be cleared away, and the ground plowed. The climate is mild and humid, the sky is generally overcast, and mists and heavy rains are frequent. If ever snow falls in the valleys, the warm chinook wind dispels it within a few hours. Except during a few days in July, the heat is never extreme. Thunder storms occur only in the mountains. This region is noted for the excellence of its large and small fruit. Potatoes, rutabagas, cabbages, peas, carrots, cauliflower, and other vegetables flourish. Wheat and other small grains do well. It is too cold for corn.

FIG. 1. FOOT LOG AND FISHING SCENE.

At first, the life of a homesteader is a lonely one, there being very little social intercourse, and much work to clear the land. It is different with a man of means, who can employ men and oxen to pull stumps and grub the land. I may, therefore, be allowed to say: Do not venture out here without sufficient means to support you for a year or two until the farm is opened. Grass for cattle is very scarce in these pine woods. The soil must be deficient in lime, for the eggs of poultry have very thin shells. The ferns and wild blackberries grow luxuriantly, and the wood mice and bluejays are troublesome. About one-fourth of the land can be cultivated, the rest is rocky and covered with pine timber, furnishing a great industry to lumbermen. [The illustrations herewith are from nature. Fig. 1 shows a foot log and fishing scene on the Snoqualmie river; and in Fig. 2 is seen a ranch on the middle fork of this river.]

P. O. MUELLER, Seattle, Washington.

The Raisin Industry of California.

Fresno county has about 50,000 acres in grape vines, of which more than two-thirds are of the raisin sort. There is a general rush with the whole population of the county to plant new vineyards which will average all the way from five acres up to a 640-acre vineyard. The mode of propagating the grapevines with us is simple and easy. The vines are pruned in February, and the trimmings are cut into lengths varying from one foot up to 18 inches. These cuttings are set into nursery beds to root for the next spring's planting, although they may be set directly in the vineyard when soil, irrigating facilities and climate are favorable; but the rooted vines are preferred by old vineyard men. The vines are generally planted eight feet apart each way, with an avenue of about 10 or 12 feet in every sixth or eighth row for a driveway. The vines are pruned and trained to the ground, thereby dispensing with trellis or stakes, and the vines protect the ground and fruit from the vertical rays of the sun. The grape ripens in July, August and September, with a second crop later in the season which is generally a little too late to escape the early fall rains which often come in the latter part of September or the first of October. The general mode of drying is by the natural rays of the sun which supplies ample heat for the first crop of grapes. For the second crop, resort to the evaporator is sometimes necessary.

JAMES E. DONNELL, Fresno Co., California.

Jamaica's Great Fruit Industry.

The banana is rapidly becoming the leading export fruit to the United States owing to the rapidity with which it comes into bearing, the demand for it, and the unlimited market offered. It is also easily set out, the number of plants that die in transplanting being very small. The ground is first cleared, the trash burned, the land plowed, and the stalks put out from 15 to 18 feet apart. Nothing more is done to them in many instances, until the fruit is ready to pick, but I have heard of cases where the cultivators cut down the grass and piled it over the roots to preserve moisture in the soil, or to act as a fertilizer. I have seen banana fields said to have an area of 100 acres, but as the plant seems to thrive everywhere, from deep valleys to high hills, it does not impress one so forcibly when it grows in masses, although the effect from a distance is much greater than when one is near it. Banana culture must be profitable, if a statement made to me by a small grower is true, namely, that he had cleared $1,250 on six acres of plants two years old. There are three American companies now on the island engaged in cultivating bananas for the American market, and I understand that a company composed solely of Jamaicans will soon enter the field as competitors in the business. This company has ample capital, and having extensive commercial connections will be able to dispose of all the fruit it can raise without any trouble. The rapid growth of this industry may be inferred from the fact that the total value of all the fruit exported from the island in 1887 was about $1,000,000, whereas the value of the bananas, alone, exported now amounts to nearly that sum. Large as this increase is, it is nothing compared to what may be expected within a few years, when American capital is introduced to develop all the fruits of the island.

J. M. MURPHY, Kingston, Jamaica.

Protection Against Mountain Lions.

A horse-breeder, whose range is in the Dos Cabezos mountains, in Southeastern Arizona, lost within a few weeks, in the summer of 1890, nine good-sized colts by mountain lions. He thought of putting cow and sheep bells on the remaining colts as a protection, but, finding that the belts on their necks required to be let out every few weeks, he finally put them on the mares. From that time there were no further losses. In 1891 one colt was killed, but its mother did not have a bell, and she had strayed away from the band. All his brood mares are now wearing bells, and these he regards as an absolute protection against lions and all other wild beasts.

JOHN DARE, Cochise Co., Ariz.

Milking on a Wyoming Ranch.

Many days of dusty travel elapsed before we arrived at the much-talked-of "horse ranch," which was situated near the Johnson and Fremont county line, in Wyoming. We were met on the last day by Uncle Dave with a fresh team, and his favorite saddle horse, Sage Brush; so we passed over the "trail" with a triumphant air. I rode beside Uncle on a "male" saddle, wearing a broad brim felt hat, and a long gray linen duster. Next morning at breakfast I made known the children's desire for milk, and said, with a good deal of confidence, "I suppose you have some gentle cows, Uncle Davy?"

Wel-l—yes,—if we can find them! It is so much trouble to keep a cow up, I have quit trying." This was appalling! The Rattlesnake range full of cattle and not a drop of milk! Charley said, "We will drive in a heifer and break her." In the evening when I saw them driving a "buneh" to the carrol, I knew he had kept his word. After supper, which consisted of stewed beans, fried antelope with brown gravy, dried apple sauce, baking-powder biscuit and black coffee, the milking began. As there was not room on the side of the little mountain creek where the cabin stood to build a "corral," it was situated on the opposite side, a little lower than the house, so I could sit by the door and see the movements of the milkers. The two Daves tightened the cinches on their already saddled horses, and carefully coiled their hair-rope lariats; Charlie let down the bars, and they rode cautiously into the corral; the bars were replaced and well secured, Charlie taking a seat on the fence. One throw secured the cow by her horns, the next caught her right hind foot, the riders being now on opposite sides of the corral, with the cow stretched out between them. At this point Charley slipped over the fence with a lard bucket, and proceeded to milk. It was so out of the usual manner of range life, that the now thoroughly frightened animal began all sorts of antics, and at last, owing to a false movement of one of the horses, her foot slipped from the noose, and Charley made haste to see how tall the fence was. After many trials she was finally milked, Charley bringing in as much as Edith could drink.

A. D. HANK, Johnson Co., Wyoming.

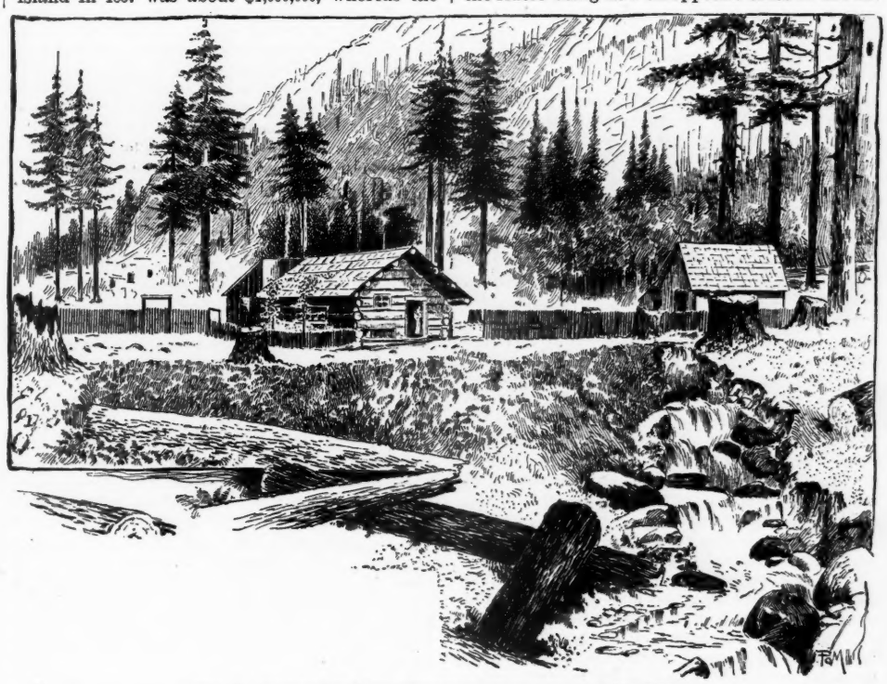


FIG. 2. RANCH ON THE SNOQUALMIE RIVER, WASHINGTON.

FARMING IN FOREIGN LANDS.

Imports of sheep from Russia to Austria have been prohibited.

Field mice are devastating the agricultural districts of Greece.

Horse sickness and wire worm in sheep are prevalent in South Africa.

Steps are being taken to establish a council of agriculture in Tasmania.

The government of Cape Colony offered $1,000 in special prizes for a raisin show.

The codlin moth has been ravaging the pear, plum, quince and apple trees in Southern New Zealand.

Irregularity in the weight of packages of New Zealand butter is complained of by the trade in England.

The southern portion of Algiers has been invaded by a swarm of locusts, which has destroyed cereal crops.

Heavy rains have delayed farming in Canada. The area planted to wheat this spring will show a fair increase.

The German Department of Agriculture is organizing a system of monthly crop reports, based upon the American plan.

Along the coast of Peru there is no rainfall, and all agricultural operations are carried on by a complete system of irrigation.

Owing to the dry season in New South Wales the must from the grape crop was much heavier than usual for the vintage just ended.

Crops at Lismore, New South Wales, have been ruined by floods. Lismore is a rich pastoral and agricultural district north of Sidney.

A dairy, stock farm, and agricultural experiment station are to be established this year, in connection with the University, at Leipzig.

A Swiss savant has the credit of reducing milk to a dry powder, so that, by the addition of water, it at once assumes its natural properties.

The best Schleswig-Holstein butter, with 20 per cent. of Galician or Finnish butter and water added, is being sold as factory or packed butter in Europe.

The district of Alberta, N. W. T., is a rich dairy region with cold, clear streams, and luxuriant grasses. The ranches are also raising numbers of sheep and horses.

A show of live stock, agricultural machinery and implements has just been held at Budapesth, Hungary. Premiums were awarded, for horned cattle $500, sheep $200, hogs $100, poultry $120.

New Brunswick produces every kind of grain and root crop that is grown in England. The forests are also a source of great wealth, the exports of forestry products, last year, being $4,341,000.

A committee has been appointed by the German Society of Agriculture to visit England, Holland, Belgium, France, Denmark, and Sweden, in order to see what progress has been made in agriculture.

Crop reports from Russia are favorable as to the condition of winter wheat and successful spring farm work. In the Caucasus there are fears of an invasion of locusts, against which no precautions have been taken.

In addition to its adaptability for sugar-cane culture, the island of Mauritius is capable of producing maize, vegetables, tobacco, cocoanut, coffee, cocoa, tea, cinchona, palms, cereals, silk, spices and all tropical fruits.

At St. Vincent there are 40,000 acres of cultivated land out of a total of 93,987 acres in the colony. Among the exports last year were nearly 25,000 barrels of arrowroot, 103,000 pounds of cocoa, 25,000 pounds of cotton, and 2,300 tons of sugar.

Citrons grow well in the West Indies, and bear large crops in good soil at Trinidad. The fruit is prepared for export by simply cutting it in pieces, removing the pulp, placing the rind in barrels, and covering with strong salt and water.

A very dry season this year at Aburi, Gold Coast of Africa, has badly affected the young cocoa and coffee plants. The tobacco, cut and cured this year has not turned out well. Egyptian cotton is growing satisfactorily there, as also jute and indigo.

Disease in the sugar cane is rapidly spreading in Trinidad. The insect differs in size and other particulars from the ordinary cane borer. It enters the cane at the knots, makes long channels in which the eggs are deposited, and the young insects very rapidly attack the cane. No cause has yet been discovered for the appearance of the insect, and no remedy except the destruction of the cane.

Mandioca, a plant indigenous to Brazil, grows abundantly, and the root is used as a substitute for wheat flour, though less nutritive. About twenty million pounds of the flour are received yearly at Rio Janiero, and five million pounds are exported.

During the present year the area planted to vines in Uruguay will be doubled, the present production being about two million gallons. The total consumption of wine is about 20 million gallons, all of which Uruguay hopes to produce within a decade.

In the colony of Victoria, Australia, potatoes have been damaged by drouth, the new crop being light and the tubers small. In Jersey the new crop has been damaged to the extent of 750,000, the exports of last season to English markets being worth $2,500,000.

Foot and mouth disease has appeared in Italy. In Germany, 163 districts, with 774 communities, were affected with it, the disease attacking cattle, sheep and hogs. American bacon is being so rigidly inspected for trichinosis that its importation is practically prohibited.

Excluding forests and pastures, there are 5,000,000 acres of cultivable lands in Italy. Returns for 1890 show the main crops to have been: Wheat 120,000,000 bushels, corn 75,000,000, barley 8,000,000, rye 3,820,000, rice 19,650,000, beans 4,560,000, potatoes 20,000,000, tobacco 3,900,000 pounds.

Poisoned jam has been successfully tried for killing rabbits in Australia, one ounce of strychnine being required for 15 pounds of jam. This should help to get rid of any surplus fruit as well as rabbits, the only trouble being that horses and dogs will eat jam in any quantity.

The principal agricultural exports of Jamaica, 55 per cent. of which come to the United States, are cocoa, cocoanuts, bananas, oranges, ginger, pimento, rum, coffee, sugar and logwood. Bananas and cocoanuts are largely increasing, while coffee and sugar decreased last year.

In Western Australia the cost of producing wheat is fifty cents per bushel with a double-furrowed plow. With a three or four furrowed plow, and a corresponding saving in the use of larger harrows and improved harvesting, this cost can be reduced by twelve or twenty cents per bushel.

The Queensland parliament has voted a considerable sum of money for the erection of an agricultural college and the establishment of an experiment farm. The colony has been a large purchaser of foreign agricultural products, and is now making an effort to assist and protect the farmer.

In the northern part of West Australia farmers have to stand by and see their flocks dying for want of food and water. The sheep actually eat soil to allay the pangs of hunger, which only hastens their death. The settlers are virtually beggared, with nothing but poverty staring them in the face.

At Hamburg the following live stock was marketed in 1891: Horned cattle 88,581 head, calves 60,686, pigs 420,407, sheep 148,905. Of the cattle 41,065 head were from Denmark, and 4,125 from America. Their total money value was $17,500,000, the cattle being worth $70 per head, calves $30, pigs $20, sheep $7.50.

Strict regulations, prohibiting the adulteration of butter, or the coloring of margarine, are now in force in France. Any infraction of the laws is punishable by imprisonment of from six months to two years, and any omission to carry out the regulations by similar penalty of fifteen days to three months.

Scarcity of rain has diminished the growing crops in Sonora, and pasturage is scarce. Corn and beans are below the average, breadstuffs are worth 60 per cent. more than a year ago. Oranges were a fair crop and sold at $6.50 per 1,000 on the trees; shipments amounting to 22,000 boxes of 150 to 200 oranges.

In France the vines have been damaged by late frosts, and in some sections the plum crop is almost lost. Pears, apricots, cherries, peaches and nuts have suffered. Early potatoes had their stalks scorched; early peas, tomatoes, beans, citrons and melons were totally destroyed. Cereals were not injured.

British Columbia is divided into two distinct agricultural parts by the mountains which form the coast range. The coast region has a mild equable climate, while the interior has a climate of extremes, the southern part being very dry and needing irrigation. Cultivation, as a rule, is restricted to the valleys.

Grapes have been shipped through the tropics, from Sydney to Fiji, and back again, on the deck of a steamer. When picked, the end of the stalk of each bunch was bathed in sealing wax, the fruit being then put in a paper bag and packed in sawdust. After the double voyage, the grapes were in perfect condition.

In South Australia, the Angaston experiment committee on spraying has reported, through F. C. Smith, that lime sulphate of copper mixture (Bordeaux) is most effective against apricot scab and peach curl-leaf. The solutions used were suggested by B. T. Galloway, of the United States Department of Agriculture.

In Trinidad the Board of Agriculture offers a prize of $425, for the cultivation of oranges, and of $1,250 for the cultivation of coffee. Entries were to close on June 30th, the plantations to be open for inspection by the judges at any time within three years in the case of coffee, and within four years in regard to orange culture.

The acreage of spring wheat, oats, peas, beans, corn and buckwheat in Ontario is greater than the average, while fall wheat, barley and rye are less. The potato was the only field crop under the average of the last nine years. Apples failed, pears were moderately plentiful, hay was abundant, and all live stock is thriving.

In the Argentine, both wool and wheat growers have suffered from the fall in value of their produce, and the depreciation in paper money. Sheep and cows have also dropped off in price. 1,000 sheep, bred from splendid rams, selling at 70 cents each that were worth $10 not long ago, and another lot of 5,000 good sheep going at 40 cents per head.

In New South Wales ewes have been sold at 16 cents per head, and bids were subsequently made of 13½ cents. A drove of cows was offered at $2.50 each, fat bullocks could not be placed at $10, and 500 two-tooth ewes went at 50 cents, no bids being obtainable on a further lot of 3,000. Surplus supply and drouth are accountable for this condition of affairs.

The cocoanut disease has spread rapidly in the Seychelles Islands, greatly reducing the value of these estates. One good result has been, however, that the people discovered their Islands to be one of the richest spice-producing countries in the East, and that thousands of uncultivated acres, as well as the cocoanut plantations, can be rendered highly remunerative.

Although there are numerous varieties of the common sugar cane, only a few are widely cultivated, those which are propagated by cuttings or shoots, retaining all the characters and peculiarities of the parent plant. The chief variety cultivated is the Bourbon or Otaheite in the West Indies and Mauritius, and, under other names, in the East Indies and Polynesia.

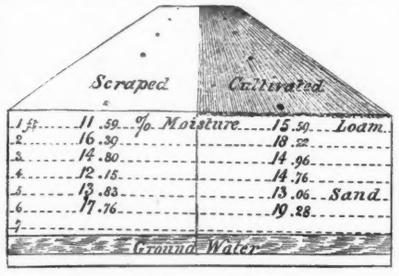
The French vintage of 1891 was larger than for seven years past, amounting to 663,000,000 gallons from 4,355,000 acres, an average yield of 152 gallons per acre. In 1890 the yield was 603,000,000 gallons from 4,541,000 acres giving an average of but 133 gallons per acre. The value of the 1891 vintage is, however, $4,000,000 less than that of 1890, indicating an inferior quality of wine for the later year.

A government commission in Western Australia has just made an exhaustive report upon the present condition of agriculture in that colony, together with the causes affecting the same. The commission also suggested in what way the cultivation of the soil might be advanced and the prosperity of the farmers increased. One of the conclusions arrived at was that agricultural depression was unknown there.

The prospects of arable and dairy farmers in Northern Queensland were not promising at the beginning of April. There had been little or no rain, and the ground was bare, clad only with dry innutritious tufts of grass. Water holes were dry, consequently live stock suffered, and field operations had to be suspended because the ground was as hard as baked bricks. The summer weather had extended over six months, the thermometer frequently reaching over 100° in the shade.

SCIENCE IN FARMING.

SURFACE CULTIVATION RETAINS SOIL MOISTURE.—The constant evaporation at the surface of the ground causes the moisture in the soil to creep upward over the surfaces of those soil particles which touch each other. Stirring the soil checks this upward movement by putting air between many of the particles. To ascertain how much moisture is retained by surface cultivation, F. H. King, at the Wisconsin station (R. '91), plowed and harrowed twelve-foot strips in the spring, and summer-fallowed them. One strip was rolled May 14th, and afterwards not disturbed except to scrape off the weeds. Another strip was frequently cultivated three inches deep until July 13th. The soil was a sandy clay loam, underlaid at four feet with sand. On May 29th, the ground water was found at a depth of seven feet, and on July 17th was six inches lower. Six times, samples were taken with a soil tube to a depth of six feet, from near the ten points marked in the diagram. Each foot of moist soil was weighed, then thoroughly dried and again weighed. Thus it was found that, from May 29th to July 17th, each square foot of the scraped surface lost, from a depth of six feet, 8.84 pounds more



MOISTURE IN PLOWED GROUND.

water than the cultivated surface. This amount is equivalent to a rainfall of 1.7 inches. As 301.49 pounds of water are needed to grow a pound of dry matter in American corn, the above saving of moisture would, in a drouth, increase the yield 16 per cent. The engraving shows the per cent. of soil-moisture, on July 25th, at each foot in depth of the slightly sloping ground. The most moisture is retained near the cultivated surface, in reach of the plant roots. Shallow surface cultivation has kept the soil moist through the severest drouths, by retaining the subsoil moisture.

WHEAT-STEM INSECTS.—The insects which burrow in the stems of wheat are described by F. M. Webster, of the Ohio station (B. 4, V). The joint worm, wheat-straw worm and the wheat-stem saw-fly, all deposit eggs in the growing stems, and pass the fall and winter in the stubble, which should be burnt, and other crops planted on the land. The grain sphenophorus burrows in the lower joints of wheat. The stalk borer does little damage. The wheat-stem maggot, the companion wheat-fly, and the American frit-fly deposit eggs on the leaves of growing wheat and other grass-like plants, work just above the upper joint, causing the head to turn white, or the center of the plant to turn yellow and die. Sowing plats of wheat in midsummer, and plowing under these and all volunteer wheat in September, will destroy many of the maggots.

DEHORNING CATTLE.—In the corn-growing States it is now the usual practice to remove the horns of cattle, to prevent the stronger animals from cruelly tyrannizing over the weaker ones. In practice it is found that the dehorned cattle require less space in yard and shed, and that from their peaceful life, they develop and fatten more rapidly. All feeding cattle are dehorned, as they require less feed, stand up closer and safer in the freight cars, and sell higher at the stock yards because of their unbruised and healthier condition, and better appearance. Pushing and goring by unruly cattle is avoided. Many hornless or polled cattle are being bred. C. D. Smith and T. L. Haecker, at the Minnesota station (B. 19), have studied the effect of dehorning upon the daily yield of milk and of butter fat. Each horn was sawed off in five seconds, and pine tar bandaged on the wound. Comparing the three days before the operation with the three days thereafter, the dehorned cows lost seven per cent. in milk flow and three per cent. in butter fat. The horned cows which saw the operation lost three per cent. in flow and 11 per cent. in butter fat. Though the operation of dehorning may cause a temporary reduction of the milk flow and butter fat, the usual flow and fat content is soon recovered, and thereafter the cows lead the quiet life so necessary to a large yield of milk and butter. The previous year a fighting cow had severely hooked a pregnant cow in the right flank, behind the last rib, and about one foot below the loins, bruising the tissues. In due time the bruised cow dropped a calf, which had no opening from the bowels. An incision was made where the natural anus should have been, but no rectum and large intestine could be found. The calf died when six days old, and the autopsy by O. Schwarzkopf showed that the bowels ended in a blind sack near the liver, that the left kidney was abnormally small and close to the right kidney, and that the spine was curved to the left. Presumably the abnormalities of the calf were produced by the horn of the fighting cow, the blow being received through the mother's flank.

SCARLET CLOVER. — In Delaware and other warm, moist climates, annual scarlet clover (*Trifolium incarnatum*) flourishes on relatively poor soils. A. T. Neale (B. 16) claims that for silage, hay, and to plow down for green manure, it compares well with any leguminous crop. It is generally sown in orchards, from July to September, just after the last cultivation of the trees. About ten pounds of seed are used to the acre. It grows during the fall, winter and spring, ripens its seed in June, and dies. As scarlet clover can be grown between crops, it is well adapted for green manuring, benefiting fruit orchards, corn, potatoes, and tomatoes. If planted with cowpeas, it is an excellent renovator of poor soils. It furnishes a winter and spring pasture, eradicates weeds, and prevents drifting of sandy soils, and washing of hillsides. More than half the present acreage is in orchards, and more is used for green manuring than for all other purposes. Scarlet clover does not stand cold as well as red clover, nor drouth as well as alfalfa, and makes less growth than either of the latter. Its late fall and early spring growth makes it a valuable crop in the warmer climates.

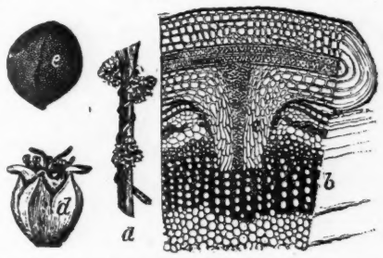
HOME-MIXED FERTILIZERS.—An insight into the feeding powers of plants, and a knowledge of the plant food in the soil, is necessary to the greatest profit in farming. Field experiments with fertilizers by the farmers of Connecticut are reported by C. S. Phelps, of Storrs (B. 8), as indicating that the best practical means of learning the deficiencies of soils, and the most profitable manures for farm crops, is by field tests. The wide differences found in Connecticut soils, and in the demands of different crops for plant food, are strongly in favor of home-mixed fertilizers. Without a knowledge of the soil, we may be furnishing those ingredients in which the soil abounds, and withholding what it lacks. Fertilizers should be so compounded as to meet the deficiencies of the soil, and, at the same time, supply the special needs of the crop.

DIGESTIBILITY OF SHEEP FOODS.—Only a part of the nutritive materials found in a food by chemical analyses, may be digestible, and the food prove a poor one in use. At the Maine station, W. H. Jordan (R. '91) fed sheep with various materials, and had the food, the fæces and urine analyzed. The portion of each food used by the sheep was thus found. Comparing equal weights, sugar beets contained the largest amount of digestible food, followed by turnips, rutabagas, gluten meal (a by-product in the corn glucose industry), mangolds, corn fodder, Hungarian and wheat bran. The greatest quantity of digestible food was produced by an acre of large corn fodder, followed by rutabagas, Hungarian millet, sugar beets, turnips, timothy, sweet corn fodder and peas. Thus, the weight of a green fodder crop does not indicate its value.

FUNGUS DISEASES OF PLANTS.—Many fruits and vegetables are attacked by the parasitic white plants known as molds and blights. W. C. Sturgis of New Haven, Conn. (B. 111) successfully destroys these diseases by spraying with chemical solutions. The lime sulphate of copper solution (Bordeaux mixture) contains two pounds eight ounces blue vitriol (sulphate of copper) and two pounds quicklime, dissolved in 22 gallons of water. This is used for scab of apple and pear, leaf blight of quince, anthracnose of raspberry and blackberry, and the rot and blight of tomatoes and potatoes. To make the ammonia carbonate of copper solution, three ounces carbonate of copper and one pound carbonate of ammonia are dissolved in 50 gallons of water. This is a remedy for bitter rot of apple, black rot and downy mildew of grape, and leaf blight of strawberry. An ammonia sulphate of copper solution is made of eight ounces sulphate of copper, one pound carbonate of ammonia, and 62 gallons water. Apply this to leaf blight of pear and wherever the ammonia carbonate of copper solution is useful. For the anthracnose of grape, a strong solution of one pound sulphate of copper to 10 gallons water is used. Onion smut is somewhat remedied by sowing with the seed a mixture of equal parts of sulphur and lime, or of sulphide of potassium and lime, but with this and peach yellows, black knot and brown rot of plums, and all fungus diseases, it is safest to plant on uninfested ground, and to burn all diseased plants or fruit. The U. S. Department of Agriculture (B. T. Galloway, F. B. 7) recommends spraying solutions of half the usual strength.

ROCKY MOUNTAIN SOILS.—The soils of the arid regions of North America have been very little affected by water since they were deposited by flood or wind. The Wyoming station analyzed the virgin soil of its six experiment farms, so that all effects of cultivation can be determined. E. E. Slosson (B. 6) publishes analyses of the soils of the Laramie Plains, the North Platte valley, and the Great Plains near Wheatland, which are remarkable for the small amount of humus, and the large quantity of minerals soluble in water. These represent the table land of the continent. The soils of mountain valleys in the Wind River and Big Horn ranges and the Black Hills, contain more humus and less alkali, and absorb less water. The ability to retain soil moisture is not stated. J. D. Conley presents a thorough geological study of the soil of the Laramie Plains, and is investigating the other regions. The biological study (R. '91) of these soils appears in the crop tests by the station and studies by B. C. Buffum.

AN ALFALFA PARASITE.—A warm, moist atmosphere is favorable to the growth of parasitic plants. These conditions are found in the flooded alfalfa fields of Nevada, where F. H. Hillman (B. 15) has studied the dodder, *Cuscuta epithymum*, shown in the engraving, which presents his sketches from nature. From the seed, *e*, a vine grows up and clings to the alfalfa stem, *b*, by the sucking root, *c*, through which the dodder thereafter feeds upon the alfalfa sap, the ground roots dying, and



ALFALFA DODDER SEED, FLOWER, AND PLANT.

the vine turning yellow. The slightly purplish flowers, *d*, are borne in clusters, *a*. This species is a native of Europe, being imported with the alfalfa seed. The small dodder seed can be removed by a sieve with twenty meshes to the inch. The vine can be killed by a copperas (sulphate of iron) solution.

SUGAR-BEET CULTURE.—Nebraska has two beet-sugar factories, one at Grand Island and one at Norfolk. Guided by the actual needs of the farmer and the factory, the experiment station at Lincoln has analyzed beets sent in from all parts of the State, and has made strong efforts to obtain reliable information in regard to what it costs the farmer to grow beets, and what yield he may expect with good cultivation. The research (B. 21) was made under the supervision of H. H. Nicholson and Rachel Lloyd, from beets grown on the station farm, from farmers to whom seed was furnished by the station and by the State Board of Agriculture, and from farmers who raised beets for the factories in Nebraska, Utah, and California. The best results were given by the land that had been longest under cultivation, and had received deep and thorough tillage. Land occupied the previous year with corn did not prove well adapted to beet growing. Fall preparation of the ground, deep plowing, and subsoiling were found advisable, to be followed, if possible, by surface plowing in the

spring. Early planting gave the beets a long season, and lessened the ravages of the cutworm. It is best to hoe the beets as soon as the rows can be seen. Thin when two-thirds of the plants have four leaves. The Klein Wanzlebener, Desprez, Vilmorin, Knauer, and Lemaire are the best varieties for Nebraska. Fifteen tons of beets, with a sugar content of 13½ per cent., is a fair average yield. This result can be reached at an average cost of $30 per acre, if the cultivation indicated is given at the right time. The actual average cost in Nebraska was $33.06 per acre, with an average yield for the State of 20.59 tons. The average yield per acre of the beets furnished the Grand Island factory was 13.6 tons, selling at the factory for $44.15. In California, at the Watsonville factory, 13.5 tons grew per acre, and at the Alvarado factory 15 tons per acre. The beets used by the Utah Sugar Co., at Lehi, yielded 13.5 tons to the acre. The experiment sugar beets made a good nitrogenous food for cattle.

FEEDING GRAIN TO UNWEANED LAMBS.—The food needed to keep animals alive is so costly, that the sooner they are ready for market the better. To find whether the vigor of unweaned lambs would enable them to profitably use a grain food of three parts corn meal, three parts bran, and one part oil meal, J. A. Craig, at the Wisconsin station (R. '91), selected nine grade Shropshire ewes with nine lambs at foot, and all on pasture. Three lambs, without grain, gained 109.5 pounds in ten weeks, their ewes on pasture alone. Three lambs, without grain, gained at the rate of 123.75 pounds in ten weeks, when their mothers were fed 80 pounds of grain. The other three lambs were fed 80 pounds of grain, and gained 134.5 pounds in ten weeks, their mothers having pasture only. One pound was added to unweaned lambs by feeding 5.6 pounds grain to their mothers, but 3.2 pounds grain fed to the sucking lambs added one pound of mutton.

CROSS-FERTILIZING FRUITS.—At the Iowa station (B. 14) crosses of hardy fruits are being made, in order to improve varieties. J. L. Budd reports that, from the promising appearance of these methodic crosses and hybrids of mother varieties of known adaptation to the severe interior climates, there will result a greater number of valuable varieties for the prairies than could be developed in several generations from seeds of the largest specimens of the best or earliest fruits.

NITRATE OF SODA FOR TOMATOES.—Three years' experiments with nitrate of soda by E. B. Voorhees, of the New Jersey station (S. B. 1892) show that for tomatoes nitrate of soda, alone, is superior to either barnyard manure or mineral fertilizers, but is less effective than the complete manure. On land previously liberally fertilized with phosphoric acid and potash, nitrate of soda used alone, in small quantities, gave the best and most profitable results. With the small quantity of 160 pounds of nitrate per acre, the second application was advantageous, but 320 pounds per acre was most effective. The soils used were a sandy loam in Southern New Jersey, in a section largely devoted to raising tomatoes for the early markets, and a clay loam in Northern New Jersey. The maximum yields of tomatoes seem to depend upon a full supply of immediately available nitrogen, but as phosphoric acid and potash are also needed, the farmer should know the capacity of his soil for the crop in order to economically use commercial manures.

ROOT PRUNING OF CORN.—The claim has been made that cutting the roots of American corn would cause many rootlets to grow, and thereby increase the yield. G. E. Morrow and F. D. Gardner, at the Illinois station (B. 20), root pruned three times, from June 19th to July 10th, every alternate row of 18 rows of corn, two rods long, by placing around each hill a frame twelve inches square on the outside, and passing around its outer edge a knife gauged to a depth of four inches. The root-pruned corn yielded 49.4 bushels per acre, and the unpruned 73.1 bushels. Experiments through the last four years show an average yield for root-pruned corn of 60.5 bushels, while the unpruned yielded 81.5 bushels. Roots pruned three inches deep yielded more than those pruned four inches. One-third of the corn was cultivated deep, one-third shallow, and one-third was not cultivated, but had the weeds scraped off. The latter was most injured by root pruning, and the deep cultivated least, showing that cultivation is a root pruning process. But experiments, through the same four years, showed that shallow cultivated corn yielded 75.9 bushels per acre; the not cultivated but weed-scraped, 72.9 bushels; and the deep cultivated, 70.8. Root pruning was injurious, and shallow cultivation did best.

NUMBER OF PARTICLES IN SOILS.—The size of the particles of a soil largely determines its water-holding capacity, and thereby its fitness for certain crops. M. Whitney, of the Maryland station (R. '91), is investigating farm soils in the well-equipped laboratories of Johns Hopkins University, under the supervision of the station, and aided by the U. S. Department of Agriculture. The accuracy and thoroughness of the investigation is a credit to American science. Among other results, it was found that no crop can be successfully grown, unless highly manured or irrigated, on a soil having so few as 1,700,000,000 particles in a teaspoonful weighing a gram. Good market truck is grown on a soil having 6,868,000,000 particles in a gram. Tobacco soil contains 8,258,000,000 particles, wheat soil has 10,358,000,000 particles, and limestone grass land contains 24,653,000,000 particles in one gram.

Notable Articles of the Month.

ENERGY AS A FACTOR IN AGRICULTURE has been much neglected, writes Dr. Manly Miles, in the *Popular Science Monthly*. In the nutrition and growth of plants is required an expenditure of energy, which has been defined as "the power of doing work, or overcoming resistance." The most important processes are the building of organic substance, the exhalation of water by the leaves, which is constantly taking place in their processes of nutrition, the evaporation of water from the surface soil, and the warming of the soil. As an example of vegetable force, President Clark's squash raised 4,120 pounds in its processes of growth. In field experiments, the results obtained with manures must largely depend on the expenditure of energy in these ways, and the supply of plant food in the manure may be of secondary importance to the growing crop. An acre of Indian corn, yielding 60 bushels, involves an expenditure of energy in exhaling moisture equivalent to the work of more than 25 horses, day and night, without cessation, for six months. Estimating the soil evaporation in the Middle States at about twice the amount exhaled by a growing crop of fair luxuriance, 16 inches of rainfall will be disposed of by evaporation from a fertile, well-drained soil, and eight inches by exhalation from a growing crop, an aggregate of 24 inches. This involves an expenditure of energy represented by the heat produced by burning 320 tons of coal per acre, or the equivalent of the work of 73 horses, day and night, without intermission, for six months. If to this is added the energy expended in building up the organic substance and in warming the soil, the sum would represent the normal demands for energy in growing a crop of one acre. This enormous expenditure of energy seems to be quite as essential to the well-being of the crop as the supply of food constituents, and any conditions that tend materially to increase or diminish it must be looked upon as injurious. Thus, the rain that falls in excess of the normal requirements of the crop and soil must be removed by evaporation, and this calls for a very considerable expenditure of energy that on drained land might be made available in useful work, to say nothing of the influence of removing surplus water by evaporation on the soil and the biological characteristics of the plant. The removal of surplus water by drainage obviates the necessity for an enormous expenditure of energy. Prof. Miles discusses the energy of animal life and work on the same lines.

IMPROVING HORSES ON A NATIONAL SCALE.—The Austrian government is spending a large sum annually improving the horses of the country, and the great stud-farms maintained for this purpose at Mezohegyes and Radautz are described in an interesting manner by Frederick Wrench, in the *Nineteenth Century*. At the first-named farm, which is equipped with the latest devices and conveniences of all kinds, are about 2,300 horses, 2,700 working bullocks, 12,000 sheep, 7,000 pigs and 28 straw-threshing machines. Nearly 10,000 men, women and children are employed, 2,400 of this number coming from the North of Hungary for the summer's work and returning to their homes in winter. In all the imperial studs, the horses are under military control. There is a regular staff of officers, veterinary surgeons and soldiers, 237 in all, under the commandant at Mezohegyes, who is responsible to the Hungarian Minister of Agriculture. The object of the stud, to improve the breed of horses in the country, has been so far fulfilled since its establishment in 1785 as to make even the Austrian hack horses renowned for good breeding and looks. All the best animals bred in the stud are kept for stud purposes, and there is a regular drafting each year, so that the stud is kept up to the highest state of perfection. Also, each year 200 of the best colts in the country are purchased from the big landowners and others, the best being kept as sires and the others sold as geldings. The stallions at Mezohegyes may be divided into four classes, as follows: Those for stud purposes, 19 in number; those let out to private proprietors, who pay from 300 to 800 florins, or from $108 to $288 per year; those stationed at military stations throughout the country and let out at fees varying from two to five florins, 72 cents to $1.80, and those sold to the communes or municipalities. The young horses not kept for the stud are sold at auction in Buda-Pesth, at four and one-half years old. They are trained to ride and drive, and are guaranteed sound; if any defect should exist, the full particulars are given by the auctioneer. Every animal in the stud is branded with two marks and a number, which show its sire and its dam's breeding. This government brand is much valued in Hungary. The Mezohegyes horses bring an average of about 860 florins, or $310, at auction in Buda-Pesth. Some of the sires in this stud are thoroughbred English, some half-bred, others of various breeds and mixtures. The mares are Anglo-Arabian, Anglo-Norman, and so on. The Radautz stud has 1,350 horses, including some English thoroughbred stallions and pure bred Arabs. In the entire country, 2,000 Radautz stallions are stationed, with service fees of 36 cents to 72 cents.

INCALCULABLE ROOM FOR IMMIGRANTS is the title of an article by Mr. Edward Atkinson, in the *Forum* for May, in which he dwells at some length upon the immensity of the area in the United States as yet uncultivated, and remarks upon the constantly-increasing demand for labor on farms, at wages that are much higher than they were 10 or 20 years ago, the supply being insufficient. The mortgage is proved by the last census to be an insignificant factor in the agricultural problem. As for room, Mr. Atkinson said to an Englishman ten years ago: "If you will send from England and Scotland intelligent and industrious men to occupy that portion of Texas by which it exceeds Germany in area, comprising a patch larger than Great Britain, we will presently return to you from that now unoccupied territory the present cotton crop of the United States [then four million bales] and the present wheat crop of the United States [then 250 million bushels]. We will support all the people who make these crops on what we do not export; and if you are not satisfied we will also feed cattle upon the winter wheat, in order to keep it below the first joint until after the danger from frost, and we will then send you a large amount of wheat from that product." The territory referred to in this offer is at present sparsely populated. The Indian Territory and Oklahoma together make a productive body of land of about the same area as Great Britain. The Llano Estacado, or Staked Plain, comprising a part of the Panhandle of Texas, is one of the most suitable areas on this continent for the production of fruit in great variety. In the mountain region of eastern Kentucky, eastern Tennessee, southwestern Virginia, and the mountains of the Carolinas and Georgia, a square could be laid off nearly as large as France and twice as large as Great Britain, possessing potential in agriculture equal to either, timber and minerals, especially iron, equal to both combined. This area has, as yet, only begun to be worked.

The wheat crop of this country, cultivated as yet by unscientific methods of agriculture, is grown on two per cent. of the area of the country (omitting Alaska), and furnishes a large quantity for export. When science shall be presently applied to the enrichment of the soil and to the proper nutrition of men as well, the whole present population of this country will be able to derive complete nutrition from one-half the soil that is even now under cultivation. Land is more easily obtained than ever before, though the public land is nearly all disposed of. If farming is not profitable, why do the crops steadily increase?

Moles in Hotbeds.—Florist, Camden, N. J.: When ground moles get into a hotbed and burrow under the plants they are in a position to prevent their being caught by the ordinary mole traps, and the same is true when one burrows under the walls of a greenhouse and gets into a bench filled with choice roses or other plants, but they can be suffocated with liquid bisulphide of carbon. Make a small hole in one of their recently-made burrows and pour in a half gill of the sulphide, and cover the hole made with a brick to prevent the fumes from escaping. If you can find the place where the mole entered the hotbed or house, that would be the proper place to pour in the suffocating liquid. A gallon jar will cost but little, and it will often be found very useful in checking the advance of a mole upon a choice bed of plants, and where a trap cannot be employed with advantage. In the open ground a good mole trap is best, because, with this implement, we are certain of the mole, and in the other he may be only driven away, and not killed.

Coal Ashes and Peanut Blossoms.—J. P. P., Ogden, Utah: Ashes from anthracite coal are not valuable as a fertilizer but they loosen clays and fill sandy soil. They are worth saving and spreading upon land under cultivation. We have long made a practice of sifting our coal ashes and using the finer parts as a topdressing on grass, also for both flowers and vegetables, and consider them of far more value than is shown by chemical analysis. They absorb moisture and gases from the atmosphere and these in turn become the food of plants. Make some experiments with these ashes upon different soils and crops, and determine their value by such tests. In the cultivation of peanuts it is not necessary nor advisable to cover the blossoms, but keep the surface soil loose about the plants and the embryo pods will find their way underground at the proper time.

White Oak versus Cedar Posts.—Mrs. T. S. Chapman, Jersey Co., Ill.: We should much prefer white oak to the white cedar for fence posts if both were grown in Illinois. The durability of timber depends very much upon the soil on which it is grown. For instance, the slow-growing locust from the poor light soils of Long Island and New Jersey is one of the most durable woods known, but we have seen locust timber grown in Illinois which was scarcely more durable than our common basswood. There are, however, two very distinct species of evergreen tree known under the name of white cedar; one, and the most common, is the American arbor vitæ (*Thuya*) and the other the swamp cypress (*Chamæcyparis*). The latter is the most durable of the two.

Fattening Hogs.—J. Price, Marion Co., Fla., desires to know "which is the cheapest and best feed for fattening hogs, corn or cotton-seed meal?" He states that the hogs in that region are of "the native breed," some being called Razor Back stock, and others Guinea hogs, the latter of which is too small for profit, and the former "chiefly head and snout." In answer to this inquiry, F. D. Coburn, author of *Swine Husbandry*, writes us: "The averages of 34 analyses of corn meal and 24 of cotton-seed meal, show the cotton-sped meal exceedingly rich in albuminoids, and scarcely suitable to be used alone, but, without positive knowledge upon the subject, I see no good reason why the cotton-seed meal, reasonably used in conjunction with other carbonaceous stuffs, should not be excellent for hogs. My friend, Prof. Georgeson, of the Kansas Agricultural College and Experiment Station, thinks one pound of it, used to each ten pounds of corn meal, would give a fattening food for hogs much superior to corn meal alone. He further says, 'I would never feed it in a more concentrated form than this; since the cotton-seed meal that comes upon the market has had most of the oil extracted, I see no reason why it should cause the pork of hogs fed upon it to be oily or unduly soft, although experiments might possibly prove that it had some such effect. It is only recently that feeders have awakened to the value of cotton-seed meal as a feed. As a cattle food it proves itself, so far as it has been experimented with, to accomplish all that we could expect from its composition. As it easily spoils, or would if kept long, it should, of course, to be palatable, be used when fresh.'"

Poisonous Plants.—Mary, Jamaica, L. I.: When you ask us to tell you why certain plants will poison some persons, if they merely touch them, and not others we must confess that we do not know. The writer has worked among plants all his life and handled the poison oaks (*Rhus*) thousands of times and in all kinds of weather without suffering the least inconvenience, but the little Chinese primrose (*Primula obconica*), will burn him worse than fire. After trying it for three years in a greenhouse, we were compelled to discard it on that account, and yet others, whose hands must be far more delicate and soft than ours, handle this plant with the greatest freedom. There are a great many phases of plant-life that are still a mystery, but our florists and chemists are constantly making new discoveries in their special fields of investigation and will probably continue doing so for many centuries to come without learning all that is worth knowing.

Water Ash.—George A. Sunderland, Marshall Co., Ind.: The twig and racemes of inconspicuous flowers you send appear to be those of the water ash, or black ash tree, (*Fraxinus sambucifolia*). The flowers have neither calyx nor petals; consequently are said to be entirely naked. These clusters of flowers you will notice appear from the axils of the leaves of the previous year, and on the one-year-old shoots. This species of the ash is common along streams everywhere in our Northern States. The wood is very tough and easily separable into thin layers, and was formerly used for making baskets.

Peach-Leaf Curl.—William Lowey, Kings Co., N. Y.: The peach leaves you send are attacked by a minute fungus known to mycologists as *Taphrina deformans*, producing what is called peach-leaf curl, which usually appears early in the season, affecting the first leaves developed on the trees. Sometimes the disease remains long enough to attack the young shoots when a few inches long, but this is not common, for when the warm weather comes along the fungus disappears. The cultivators of the peach have not made any special effort to eradicate this disease, but it is quite probable that spraying the trees with a solution of sulphate of iron, copper, carbolic acid or even with lime water would destroy the fungus.

Milk Direct to Customers.—R. B. H., Malden, Mass.: Your idea of purchasing a farm within 15 or 20 miles of Boston, on which to keep cows, and deliver the milk direct to customers at six cents per quart, is not impracticable, and the results may prove satisfactory and profitable. Much will depend upon the price you have to pay for the farm and the fertility of the land. There will be no difficulty in finding customers for the milk at the price named, and perhaps a higher one, but before you invest in the farm and 50 cows, make some inquiries about the price of labor, as you will require help to take care of the cows and to deliver the milk daily in the city. Keep in mind accidents, bad weather, bad debts, and sometimes very untrustworthy help, and, after duly considering all these phases of the business, go ahead, if you think the chances are favorable for making a good profit on the investment. Many farmers do make money in selling milk at even less than six cents per quart.

Raspberries and Melons.—L. Williams, Walworth Co., Wis.: 1. There is comparatively little difference in the quality or flavor of the different varieties of the blackcap raspberries, but there is considerable difference in the size, productiveness and season of ripening. The Ohio and Tyler are both hardy and productive varieties and largely raised for market. The only care given the red varieties of the raspberry, as raised in the Eastern States for market, is clean cultivation, the removal of the old canes soon after the crop is gathered, and a light pruning of the bearing canes early in spring; that is, cutting back the tall canes to about four feet in height. 2. We do not remember ever having said that melons "would not mix" if planted in the same field or garden, for we know it is very difficult to keep the varieties pure even when planted within a half mile of each other. We may have said that melons would not mix with cucumbers, pumpkins and squashes when raised in the same garden, which is true, because these fruits are of a different species and not very closely allied, except the pumpkin and squash, and varieties of these two do readily mix, but not with melons.

Apple Tree Bark Scale.—A Subscriber, Coos Co., Ore.: The scales on the pieces of apple tree bark you send were so completely rubbed off when they reached us that we are unable to identify the species. Send us a few of the young twigs wrapped in soft tissue paper, if you find any scales on them. It is rather strange if any species of scale insect should be found on young apple trees planted on newly-cleared land, and we are inclined to think that it is not these pests that prevent the trees from making a vigorous growth. It may be that the soil is too cold and wet, as you say the trees are planted on bottom land near the river. Cut the trees back and keep the grass and weeds away from their stems. We have known apple trees to fail because planted too deep in a cold soil; then, again, because too shallow, but rarely the latter in moist soils.

Straw Beehives.—Frank McNiver, Union Co., N. J.: While the old straw cone-shaped beehive is referred to in hundreds of works on beekeeping and in encyclopedias, we do not now remember of ever reading any direction for, or description of, their manufacture. It may be that authors generally have considered the process too simple to need describing, for these hives are usually made of braided straw forming ropes an inch or two in diameter and these are laid around a form of the required size and then skewered together to give solidity and keep the hive in shape when removed. A full size straw hive will hold about three pecks, but they are sometimes smaller. They have been generally discarded because they afford an excellent hiding place for the worms of the bee moth, and are very difficult to keep clean, and in no way superior to hives made of pine boards, which are also cheaper and far more convenient for dividing swarms, removing surplus honey, etc.

Roses, Asparagus, and Potatoes.—William Wakefield, Ramsey Co., Minn.: 1. The small greenish-white caterpillars feeding on the underside of your rose leaves can be destroyed by dusting them with fresh Persian insect powder, or Buhach, as it is called in California. To apply this powder to the underside of the leaves you will need a small hand bellows, an instrument usually kept on sale with the powder. 2. To destroy an old asparagus bed you may either dig or plow out the roots, or use the land for some crop requiring frequent hoeing during the summer, for if the asparagus stalks are kept cut down throughout one entire summer, the roots are sure to die, and the next spring they can be readily plowed up. 3. When potatoes are raised on the same ground for several years in succession, they are very likely to be affected with scab. The disease is not so likely to appear when commercial fertilizers are used, as where barnyard manure is applied. Soak seed in *weak* corrosive sublimate.

London Purple and Paris Green.—For the common insects which devour the leaves of plants, and for the codling moth, H. Osborn, of the Iowa station (B. 17), recommends one pound London purple or Paris green to 200 gallons water. For apples it may be applied a little stronger. For plums and peaches, either dilute, or add four gallons lime water. Spraying is most effective after the trees have dropped their blossoms.

Oregon Moles.—J. R. Oatman, Multnomah Co., Ore.: The Oregon ground mole (*Scalops Townsendii*), is a distinct species from those found east of the mountains, it being much larger and darker in color, but we presume its habits are somewhat similar, burrowing in the ground, making long tunnels or runways near the surface, and occasionally throwing up little mounds, which are not only unsightly but troublesome, on lawns that are kept closely cut. We have tried various poisons and suffocating gases introduced into their burrows without obtaining anything beyond temporary good results. We now depend entirely upon traps to rid our garden of this pest. Perhaps to say "rid our garden" is too strong a

term, for no matter how many are caught in a season, others come from neighbors' grounds to take the place of those killed. But by constant watching and trapping, we do keep the moles somewhat in subjection. Last summer we caught and killed 33 moles in our lawn and vegetable garden with one trap, and this season, up to May 24th, only six, and have seen but few signs of others.

To Keep Tarred Corn from Sticking. — Subscriber, Niles, Mich.: When pine tar is used on seed corn, the kernels may be kept from sticking together by stirring in a quart of salt to the peck. Plaster of Paris will answer the same purpose, but salt is more objectionable to vermin and other pests.

Smudge for Plum Curculio.—D. D. Sanderson, Hill Co., Tenn., writes us: "For more than 20 years I have prevented the ravages of the plum curculio with a smudge made by burning a mixture of one-third cut tobacco stalks or waste, and two-thirds oak chips. Sprinkle with water to make the smoke dense, place in a large iron kettle, and kindle with a shovel of burning coals. The kettle should be kept burning under each tree until it is thoroughly fumigated. It is best to do this near sunset, when the air is calm. If the kettle is placed on a cart, it can be conveniently rolled from tree to tree. The smudging should be repeated after rains, while the fruit is green. Stone coal, sulphur, old leather, hair, or tar, may be burned instead of tobacco."

Duty on Thoroughbred Shire Horses. — The American Shire Horse Association at its Chicago meeting, protested against the recent ruling of the Secretary of the Treasury that no imported animal shall be admitted to the United States, free of duty, unless accompanied by a certificate showing that all the ancestors have been recorded in a book of record established for its breed for five generations on the side of the sire, and for four on the side of the dam. The breeders claim that very few, if any, animals of the old-established and world-recognized breeds can be admitted duty-free under this ruling, on account of the comparatively recent establishment of a system of public registration of pedigrees. Hitherto, the custom officials have accepted the certificate of the Stud Book Association of Great Britain, which registers only the very best animals.

Grape Nomenclature.—In answer to an inquiry, as to the identity of *Vitis riparia* and *Vitis vulpina*, Prof. T. V. Munson, Texas, writes us: "Dr. N. L. Britton, curator of the Columbia College Herbarium, made a journey of investigation in Europe last summer, and recently wrote of this that he saw Linnæus's original specimen *V. vulpina*, and that he is sure it is nothing more, nor less, than *V. riparia*, of Michaux, agreeing with the great grape botanist, J. E. Planchon, in this. So *V. riparia* Michx. becomes a synonym of *V. vulpina*, *L.* and *V. vulpina*, Gray, Engelmann and other botanists, becomes a synonym of *V. rotundifolia*, Michx. which is the Southern muscadine."

Beef Cattle in Chicago.—Charles Greene, White Pine Co., Nev.: All live stock is quoted and sold in the Union stock yards of Chicago on gross live weight. A 1,500-pound steer, quoted at $6 per cwt., sells for $90. At the rate of 56 pounds dressed meat to 100 pounds live weight, the dressed beef would cost the buyer about 10 cents per pound. The better qualities of beeves dress the most meat. Thus, if $3.30 live beef dresses 55 pounds to the cwt., $5.04 beef will dress 56 pounds, $6.84 beef 57 pounds; $3.30 gross nets 55 pounds or $6 per cwt. net, $5.04 gross nets 56 pounds or $9 net, $6.84 gross nets 57 pounds or $12 net.

Moisture in Incubators.—H. L. W., Worcester, Mass.: The proper degree of moisture in an incubator is a matter that cannot be considered as a settled question. The tendency, in these days, is to less and less moisture in the machines until near the end of the hatch; once it was the reverse, and it was thought that one could not get too much. If one goes back to the time of Reaumur, who introduced artificial hatching into France, and who hatched chickens in barrels heated by fermenting manure, he will learn that this old scientist was successful only when he excluded all moisture from his barrels. The Egyptian hatching ovens are also run without moisture. But the prevailing opinion in this country is that moisture, in small amount, should be employed after ten days, and that about the eighteenth or nineteenth day it should be freely used. In a 75-egg incubator the moisture pans should not be more than four by five inches, if there are two; or four by ten, if one. Two are better than one, as a person can then better regulate the amount of moisture. There is an instrument, the hygrometer, for measuring the moisture in the air of the machine. But what is the correct degree of moisture, is the undecided question. By some, it is supposed that 40° to 45° is the proper humidity for a successful hatch.

Earlier Grapes from Girdled Vines.—By girdling grape vines in July, just below each fruit-bearing branch, Dr. Jabez Fisher has for three years ripened grapes ten days earlier than usual. He now reports to the Massachusetts Agricultural College that wherever a grape will ripen fairly by the natural processes, girdling is a draft upon the future which is not offset by the present gain, and that it can only be commended for climates where the fruit will not ripen naturally, and that in such places the vines should not be girdled oftener than every other year.

Remedy for Cutworms.—James Collidge, Spink Co., S. D., writes us: "I keep away the cutworms with fresh cow manure, reduced to a liquid and applied to the base of the stems of the plants of cabbage, tomato, melon, or other garden crops. I have used it for many years, and will guarantee 99 plants out of every 100, if judiciously applied. It can be put on with an old dipper, but be careful not to let it get on the leaves, as it will injure them, retarding the growth, or perhaps killing the plant. Wrapping the collar with paper is useful."

Beef *vs.* Milk.—Johnson Newman, Wayne Co., Mich., desires to know if the Herefords cannot be changed from a beef to a milk breed. This can be done by a long and tedious process of selection and breeding. But, as we have many good milk breeds at present, it will not pay to change the beef breeds into milk breeds. Time is too valuable. The product of milk can easily be increased by continuous selection of calves to be raised from those cows only who are very superior milkers. It is an erroneous notion, too generally entertained, that only pure-bred cows are always the best.

The Significance of Color of Live Stock.—M. R. Ruhe, Essex Co., N. J.: Color of fowls is often merely a breeder's fancy. One breed of fowls may be bred of several colors. But where the color is as characteristic as the special peculiarities of size, conformation, gait, and capabilities, it becomes as inherent and essential as any other characteristic of the breed. The Suffolk Punch, though generally sorrel, is now found bay, brown, or black. Originally the color was sorrel. The Percheron originally got the peculiar gray, blotched color from the Boulonnais. The best breeders in France now cultivate bay, brown, chestnut, and black, as well as gray.

Poison Oak.—E. G. Agston, King Co., Wash.: We do not know of any better way to destroy the poison oak than to dig out the plants and burn them. We presume the species to which you refer is the *Rhus diversiloba*, common on the Pacific coast from Southern California to British Columbia. It resembles in habit the *R. Toxicodendron*, or poison-oak, or ivy of the Atlantic States, having a shrubby stem, climbing trees and over old logs by rootlets. It is very poisonous to some persons while others can handle it with impunity. You can doubtless find some workman who can handle this plant without being poisoned, and then give him the job of clearing your grounds, repeating the cutting and digging next year should any plants appear. It is not often that any one is poisoned by these vines, unless they are handled when wet with dew or rain, still, there are some who cannot touch the plants at any time without serious results.

Sowing Wheat and Grass in Maryland.—F. W. Hill, Prince George Co., Md.: If good judgment is used in selecting the places where it can be excavated, the calcareous marl, which is so abundant in your neighborhood, furnishes the cheapest means for liming the land. Most of the land in Prince George's county, which has not been limed within the past 12 or 15 years, needs to have such applications to make it profitable for wheat, and encourage it to hold grass, when once seeded. Of course the wheat and the grass following should have more or less fertilizer, and phosphoric acid in the shape of bone, or Carolina phosphate ought to be applied as well as potash in some form. It is next to impossible to give definite advice on these points, however, without knowing something of the history of the land, and especially how it was treated for several years prior to the two corn crops mentioned, and which we may assume were grown without manure. The grass which we should advise to sow with orchard grass and clover is tall meadow oat. This mixture does very well in Maryland. It is harder to say what had better be sown with timothy, but we should probably try red top. For both grasses we should use a bushel to the acre, in addition to the orchard grass and the timothy usually sown.

The Chorogi.—Subscriber, Nannett, N. Z.: The recently-introduced edible tuber known as Chorogi, or *Stachys Sieboldi* may prove to be of some value, but the tubers are very small, and very few persons will care to spend their time in either cultivating or gathering them, however delicious they might prove to be when brought to the table. The few tubers we planted last year were very prolific and in the fall the tubers were dug and stored in boxes of sand placed in a cool cellar where they are now, May 10th, sound and plump, and we propose to leave them there, for the small tubers left in the ground, at the time of digging the crop last fall, have sprouted and thrown up stems in great numbers, showing that they are not only hardy but giving indications of becoming more of a pest than a thing of value in our grounds. The chorogi is no doubt a valuable tuber for some localities and under some circumstances, but individual or local experience will be required to determine when and where.

Pedigree Not Everything. — L. R., Brooklyn, N. Y., would like to know whether "it is safe to depend upon pedigree, if well authenticated, to purchase expensive stock." While pedigree is indispensable to trace pure blood, to successful breeding it is essential to have animals of individual excellence, quality, stamina, constitution, and vigor.

Red Buds.—Rambler, New York City: The small tree with a smooth bark bearing a great number of small, pea-shaped rose-colored flowers which you noticed in Central Park early in spring, is the American Red Bud or Judas-tree (*Cercis Canadensis*). The flowers appear before the leaves; consequently are far more conspicuous than if they came out later. This species is a native of the Western and Southern States and should be very common in Eastern gardens and pleasure grounds, but it is not, and probably because it is a native tree and readily obtained. The Japan Red Bud (*Cercis Japonica*) has much larger flowers but the plant is at best only a large, many-stemmed shrub; each stem and twig are usually completely covered with flowers early in spring, provided a late frost does not cut them off, which frequently happens in our Northern States.

Filling Around Shade Trees. — Subscriber, Elmsford, N. Y.: To fill in earth to the depth of three or four feet around maple and other kinds of shade trees would be injurious, and probably cause their death within two or three years, if not sooner. If the trees are too large to lift up bodily to the proper level, better cut them down, and, when the filling in is completed, plant younger specimens.

Asparagus Culture in Maryland.—W. O. Shallcross, Kent Co., Md., who has been remarkably successful in growing fine asparagus, gives us his method of planting and cultivation as follows: "As early in the spring as possible, I plow my ground, roll and harrow it well. In April, I furrow out the rows five feet apart, with a small plow. Then I use a two-horse plow for cleaning out the furrows; after this, I put four horses to a three-horse plow and run up and down the furrows until they are from 16 to 20 inches deep. The asparagus roots are then placed 18 to 20 inches apart in the row and covered with about one inch of soil. As soon as the sprouts come up, I hoe them well, and apply fine manure heavily. Before the next working, I apply 500 pounds of Powell's mixture to the acre, and do not aim to work much soil on the asparagus crown the first year. As a rule, I have better success with one year than with two-year old plants."

OUR LIBRARY CORNER.

Book Reviews.

IRRIGATION CANALS, and Other Irrigation Works, Including The Flow of Water in Irrigation Canals, and Open and Closed Channels Generally, With Tables Simplifying and Facilitating the Application of the Formulæ of Kutter, D'Arcy and Bazin. By P. J. Flynn, C. E., pp. 398+283 Ill. 8 vo. Cloth. San Francisco: 1892.

The development of the Arid Region of North America depends entirely upon the extension of its irrigation systems. Much of the fertile land can be reached only by large, high-line canals, the construction of which calls for the best engineering skill. This is the only publication which meets the requirements of the Rocky Mountain irrigation. Many perspective and working drawings add to the value of the minute instructions for the location and building of canals, sluices and flumes, dams, weirs and head gates. The chapters on the distribution of the water, effect of silt, alkali, pipe irrigation, evaporation, absorption and drainage, should be read by every irrigator. The author states that winter and autumn irrigations are growing in favor. Land, which receives a soaking then, needs less in summer, and is more easily plowed. Everywhere the verdict of the experienced is, that too much water is being used, and the outcry against over-saturation in summer is but one of its forms. In some cases much waste is prevented by irrigation through pipes, and the great expense is more than offset by the saving of water and its better control and distribution. Every investor in irrigation bonds, and in irrigable lands, should read this book. The volume is indispensable to the irrigation engineer, as the plans, formulæ and tables are complete and up to date. Sold by the Orange Judd Co. Price, postpaid, $8.

DIRECT LEGISLATION by the Citizenship Through the Initiative and Referendum. By J. W. Sullivan. pp. 120. 12 mo. Cloth. New York. Twentieth Century Publishing Co.

The merits of direct legislation by the people are discussed by the author. In Switzerland the citizens vote directly upon all proposed laws. The feasibility of adapting this method to the United States is shown in detail. Switzerland has free mail delivery every where, country and city. The post office does the work of our express companies, and controls the railways, the telegraph and the telephone. The average size of the farms is 21 acres. Many of the villages own farms which are worked in common. The laws are written so plainly that a layman may be judge, even in the highest court. The essential features of the customs and institutions of Switzerland are stated, with the reasons for their excellence. Sold by the Orange Judd Co. Price, postpaid, paper 25 cents, cloth 75 cents.

AGE OF THE DOMESTIC ANIMALS—Being a complete Treatise on the Dentition of the Horse, Ox, Sheep, Hog, and Dog, and on the Various Other Means of Determining the Age of these Animals: By R. S. Huidekoper, M. D. Illustrated with 200 engravings. Cloth, Royal 8vo., pp. vi. 217. Philadelphia and London: F. A. Davis.

The ability to judge of the age of an animal from outward signs is one of the necessary qualifications of a stockman. This volume is the only complete treatise on the age of animals published in the English language. Dr. Huidekoper is an expert, and he has done his work well. From his own observation and from the best authorities he has presented the reader with reliable knowledge. About half the volume is wisely devoted to the teeth of the horse. The many good pictures add greatly to the value of the clear descriptions. Directions are given for telling the age of the horse, ass, mule, hinny, cattle, sheep, goat, hog, and dog. Many other signs of the relative age of our domestic animals are mentioned besides the teeth, as form, color, shape, and everything indicating age, from head to tail. An interesting chapter is devoted to human teeth. This volume will be useful to every purchaser and owner of stock. Sold by the Orange Judd Co. Price, postpaid, $1.75.

AGRICULTURE IN SOME OF ITS RELATIONS WITH CHEMISTRY. By F. H. Storer, S. B., A. M. Professor of Agricultural Chemistry in Harvard University. In two volumes. Fourth Edition. pp. 551 and 590, 8vo. Cloth. New York: Charles Scribner's Sons, 1892.

This new edition of the standard authority on agricultural science, by adding chapters on the action and development of the nitrogen-storing parasites (bacteria) of leguminous plants, and on the fermentation of ensilage, marks a great advance in the knowledge of agriculture. Human weakness has permitted the study of only the dead stalks of the plants, of the dry bones of the animals, and of little more than the mechanical changes in the soils with which the farmer deals. But physics and chemistry has made possible the knowledge of the biology of the living things on which man lives. There has been a glimpse of the life force which masters earth and air, and this standard work hastens to record the new knowledge. Many statements have been revised, and the index has been recast, adding to the value of the two neat volumes. Sold by the Orange Judd Co. Price, postpaid, $5.

EATING FOR STRENGTH, or Food and Diet in their Relation to Health and Work; together with several Hundred Recipes for Wholesome Foods and Drinks. By M. L. Holbrook, M. D.; 12mo., cloth, pp. 246. New York: M. L. Holbrook & Co.

After food is swallowed the subject should be forgotten until the meal is digested, declares the author of this volume. But, before eating, foods cannot be too carefully chosen, nor too thoroughly cooked, nor too neatly placed on the table. This book treats of the uses and classes of foods, the daily needs of the body, digestion, sources of foods, economical foods, simplicity in living, food and intemperance, fruits, diets, foods for the sick, and a number of well-selected recipes for cooking nutritious, palatable, vegetable foods. The selection and preparation of food is an index to the civilization of a people, and this volume is a mark of our progress. Sold by the Orange Judd Co. Price, postpaid, $1.

SCIENTIFIC AGRICULTURE. The Elementary Principles. By J. C. Buckmaster and J. J. Willis, pp. 195+xvi., 16mo. Cloth. London: Moffat and Paige, 1891.

The great demand for this valuable hand-book has caused the issue of this second and carefully revised edition. The greater part of the manuscript has been rewritten by J. J. Willis, Superintendent of Sir John B. Lawes' experiments at Rothamsted, and the volume contains much useful experience from that famous farm. During the last 50 years, all industries have grown more scientific, and farming is no exception to the rule. Agriculture is steadily advancing beyond the application of traditional customs and rules. This volume is used as a text book in the Agricultural School of England. Sold by the Orange Judd Co. Price, postpaid, 75 cents.

NOXIOUS AND BENEFICIAL INSECTS OF THE STATE OF ILLINOIS. Sixth Report of S. A. Forbes, State Entomologist; Springfield, Ill., 1891.

Among other notable insects of the upper Mississippi Valley, this Report contains extended descriptions of the Fruit-Bark Beetle, the Plum and Peach Curculio, the Plum Borers, the common White Grubs, the Hessian Fly, the Corn Root Aphis, a Bacterial Disease of the Larger Corn-Root Worm, and a Summary of the Diseases of the Chinch Bug, with a list of publications thereon, by S. A. Forbes, Otto Lugger, F. H. Snow, and F.M. Webster. The appendix contains an analytical list of the entomological writings of William Le Baron, second State Entomologist of Illinois.

SPRAYING CROPS. Why, When and How. By Clarence M. Weed. pp. 110. Ill. 16mo. Cloth. New York: Rural Publishing Co., 1892.

Practical instructions for the use of spraying machines are given in this little book. The most injurious insects and plant diseases are briefly described. Directions are given for mixing the solutions, and for spraying large and small fruits, nursery stock, shade trees and flowers, vegetables, field crops and domestic animals. The volume will be of great use to the busy farmer. Sold by the Orange Judd Co. Price, postpaid, 75 cents.

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Diseases of Beast and Fowl, Homeopathic treatment. By J. Moore, Philadelphia: Boericke & Tafel, 1892; pp. 30, 16mo., paper, 25c.

Agricultural Experiments to 1892 of the Norfolk (Eng.) Chamber of Agriculture. By F. J. Cooke. Norwich, Eng.: *Mercury* office; pp. 35, 12mo., paper, 50c.

Cook Book—Martha Washington. Anonymous. Chicago: F. T. Neely; pp. 309, 12mo., paper, 25c.

Tribune Almanac for 1892. Edited by E. McPherson. New York: The *Tribune* Association; pp. 335, 12mo., paper, 25c.

Flavoring Extracts and Elixirs. Preparation. By J. U. Lloyd. New York: William Wood & Co.; pp. 191, 8vo., paper, $1.50.

Agriculturists' Almanac for South Africa, 1892. By J. H. F. v. Wurzburg-Schade. Wynberg, Africa: W. P. Pub. Co., pp. 224, 12mo., paper, 50c.

Horticultural Society of New Jersey for 1891. Newark: W. R. Ward, Secretary; pp. 174, 8vo., paper.

California Trees and Wild Flowers. By C. R. Orcutt. San Diego: Orcutt S. & P. Co., 1891; pp. 32, Ill., 8vo., paper 10c.

Manual of Horticulture for Italy. In Italian. Turin: Unione Tipografico—Editrice Torinese, 1892; pp. 520, Il.., 12mo., paper, $1.25.

The Business Hen; Poultry for Profit. Edited by H. W. Collingwood. New York: The Rural Pub. Co.; pp. 150, 12mo., paper, 25c.

The Nicaragua Canal. Warner Miller. New York: The Nicaragua Canal Constr. Co., 1891; pp. 88, Ill. maps, 4to., paper.

Agriculture of Pennsylvania for 1891. Harrisburg: State. T. J. Edge, Sec'y; Agriculture, pp. 422+60; Dairying, pp. 74; Horticulture, pp. 81, Ill., 8vo., cloth.

Resources of Maryland. By J. T. Scharf. Annapolis: State; pp. 240, 8vo., paper.

Fruit Growers' Association of Ontario for 1891. Toronto: Province; pp. 160, Ill., paper.

California Board of Horticulture for 1891. Sacramento: State; B. M. Lelong, Secretary, pp. 488., Ill., 8vo., cloth.

Trans-Mississippi Congress, 1891. Denver.

New Jersey Geological Survey for 1891. John C. Smock, State Geologist. Trenton State; pp. 270, Ill., maps, 8vo., boards.

Misiouri Board of Agriculture for 1890-'91. Jefferson City: State. Levi Chubbuck, Secretary: pp. 787+24, Ill,, 8vo., cloth.

AGRICULTURAL EXPERIMENT STATION BULLETINS.

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CANADA—At Guelph, Bul. 71, spring grains; Bul. 72, roots, potatoes, and fodder corn; Bul. 73, fungicides and insecticides. At Ottawa, Report 1890, experiment farms.

UNITED STATES GOVERNMENT PUBLICATIONS.

DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C.—Report of the Secretary of Agriculture for 1891. Farmers' Bul. 7, spraying fruits. Farmers' Bul. 8, results of experiments with inoculation for the prevention of hog cholera. Statistical Report No. 2, miscellaneous series. Report on the agriculture of South America, with maps and latest statistics of trade. Statistical Report No. 3, miscellaneous series: coöperative credit associations in certain European countries, and their relation to agricultural interests. Statistical Report No. 4, wages of farm labor in the United States. Results of nine statistical investigations, from 1866 to 1892, with extensive inquiries concerning wages from 1840 to 1865. Statistical Report No. 93, distribution and consumption of corn and wheat; freight rates. Statistical Report No. 94, condition of winter grain and of farm animals; freight rates of transportation companies. Statistical Report No. 95, report of the condition of winter grain, and the progress of cotton planting; also on the freight rates of transportation companies. (With articles entitled "A Wool Retrospect," and "French Tariff and Reciprocity Treaties.") Forestry Bul. 6, Timber Physics—Part I. (A preliminary report treating of the need of investigation in this line; of the scope and historical development of the science of timber physics; and of the organization and methods of the timber examinations in the division of forestry.) Entomological Bul. 27, reports on the damage by destructive locusts during the season of 1891. Report of grass and forage Experiment Stations in the South and West. (A reprint from the report of the Secretary of Agriculture for 1891 of articles on the grass and forage Experiment Station at Garden City, Kan.; Coöperative stations in the West and Southwest; and coöperative branch stations in the South.) Monthly weather reviews for January and February, 1892. (A summary of weather conditions observed throughout the United States.) Weather Circular A, instructions to voluntary observers. Weather Circular B, directions for use of maximum and minimum thermometers. Weather Circular C, instructions for use of the rain gauge. Chemical Bul. 32, special report on the extent and character of food adulterations, and State and other laws relating to foods and beverages. Chemical Bul. 13, VI, foods and food adulterants. Journal of Mycology, Vol. VII, No. 2, March 10, 1892, peach yellows and rosette. Abstract on disease of almond trees. Plant disease, Bul. 1. Insect life, Vol. IV, Nos. 7 and 8, April, 1892. Insect Bul. 27, reports on damage by destructive locusts during the season of 1891. Forestry Circular No. 7, the government timber tests. Forestry Circular No. 8, strength of timber boxed for turpentine. Experiment Station Record, Vol. III, No. 8, March; No. 9, April; No. 10, May, 1892. Experiment Station, Bul. 7, proceedings of the Fifth Annual Convention of the Association of American Agricultural Colleges and Experiment Stations. Experiment Station Bul. 10, meteorological work for agricultural institutions.

DEPARTMENT OF STATE, WASHINGTON, D. C.—Streets and highways in foreign countries, special consular report. Local transportation and underground conduits, consular report No. 139, April, 1892. Trade of Great Britain and Ireland, consular report No. 141, June, 1892. Costa Rica, Bul. 31; Guatemala, Bul. 32; Colombia, Bul. 33; Bureau of the American Republics.

THE ANTI-OPTION BILL.

It is Passed by the United States House of Representatives.

A caucus of the majority party in the National House of Representatives voted not to take up the Washburn-Hatch anti-option bill until all the appropriation bills were disposed of. This would have prevented its consideration. The House Committee of Agriculture, therefore, instructed Chairman Hatch to move to suspend the rules and pass the bill. The House filibustered all day June 4th to prevent a vote on this motion, but it was duly made on June 6th. After a brief consideration of the merits of the bill, it was passed by an overwhelming vote.

The bill was laid on the table in the Senate. Its enemies will try to have it referred to the Finance or Judiciary committees, either of which would pigeonhole it—a polite term for suppression. Its friends will probably secure reference to the Committee on Agriculture, by whom the bill will be promptly reported and, probably, without amendments. Its passage by the Senate is doubtful, unless the friends of the bill throughout the land rush to its support.

The discussion which preceded the passage of the Washburn-Hatch bill in the House of Representatives on June 6th, was opened by Mr. Hatch, of Missouri, who dwelt upon the testimony of the president of the Chicago Board of Trade, to the effect that so-called wind sales, prohibited by the first section of this bill, are also under the ban of that Board, but the members and their clerks meet daily after business hours in another room, under guard of police, and sell millions of wind products. On Thursday, April 21, 1892, the Cotton Exchange Board of New York, without selling a single bale of cotton, sold 264,000 bales of phantom cotton and broke the price off 50 cents a bale, receiving the same commission as if they had sold real cotton. Mr. Funston, of Kansas, ridiculed the tactics of the opponents of the bill in pleading its unconstitutionality. They do not resort to the Constitution to defeat a measure for the protection of the national banks or against a tariff. He quoted a decision of Chief Justice Marshall in a case where the power of taxing meant the power to destroy. We are endeavoring to destroy a pernicious system. Mr. Tillman, of South Carolina, would vote for the bill, he said, to try to break up the system of swindling small farmers and poor people by alluring them into making "wind contracts" with rich men. Our cotton and tobacco exchanges have done more harm to the country than half a dozen Louisiana lotteries. No one but the great boards of trade, said Mr. Moses, of Georgia, comes before the committee to protest against this bill. You make a prohibitory tax to protect manufacturers, you levy a prohibitory tax to protect national banks, but when we ask you to protect the farmers, you cry "unconstitutional." This conflict about the Constitution, said Mr. Henderson, of Iowa, was fought out on the oleomargarine bill, the question has been settled; the bill is charged with violating democratic policy by giving revenue "with incidental protection." It raises revenue from "wind," be glad of that. You struck down the Louisiana lottery, whose victims were voluntary; will you refuse to strike down a greater evil, whose victims are involuntary?

On the other side, Mr. Herbert, of Alabama, objected to the bill, first, because he said Section 13 compelled a person charged with violation of the law to criminate himself, contrary to the fifth amendment of the Constitution; secondly, because an absurdity is implied in the provisions of the measure, which would diminish the number of sellers and not affect the number of buyers; thirdly, because the bill invades States' rights to regulate contracts between their own citizens. Mr. Boatner, of Louisiana, denounced the bill as a vicious prostitution of the taxing power, similar to that by which the protective tariff has been maintained. Mr. Rayner, of Maryland, objected to what he called this usurpation by the Federal government of States' rights, and to this malignant spirit of centralization. With reference to Mr. Hatch's precedent, the decision of the Supreme Court, Mr. Rayner said this held that because Congress had the right to coin money and to regulate the value thereof, therefore, it had a right to tax the circulation of the States, because the coinage of the States came in conflict with the coining power of the United States; the Washburn bill, on the other hand, contemplates taxation not for the purpose of revenue, but to destroy the contracts on which it is intended to operate. The bill does not come under the power to regulate commerce between the States, because the theory of the bill is that there is no commerce to regulate. Mr. Cobb, of Missouri, averred that the Merchants' Exchange of St. Louis was strongly opposed to the speculative abuses which the bill is intended to prevent. This measure would paralyze our home and foreign commerce. Unconstitutionality was pleaded by Mr. Warner, of New York, who characterized the bill as a bold proposition to license gambling and a sham proposition to raise revenue. Mr. Taylor, of Illinois, had no fear that the House had power, under the Constitution, to prevent him from entering into a contract to sell a thousand bushels of wheat, to be delivered on July 1st. Mr. Stout, of Michigan, denied the right of Congress to place a prohibition of commerce by means of the taxing power. Mr. Castle, of Minnesota, characterized the measure as "a bill for the purpose of depreciating all the products raised by the farmer." A prostitution of the taxing power was the argument of Mr Patterson, of Tennessee, against the bill, also of Messrs. Covert and Cummings, of New York.

The vote for the bill was 167 yeas to 46 nays, as follows (omitting 116 who did not vote because not present or dodging.)

YEAS—167.

Abbott,	Culberson,	Houk, Ohio	Reilly,
Alderson,	Curtis,	Johnson, Ind.	Richard'n,
Alexander,	Daniell,	Johnstone,	Rife,
Arnold,	Davis,	Jolley,	Robertson,
Atkinson,	De Armond,	Jones,	La.
Babbitt,	De Forest,	Kem,	Rockwell,
Bailey,	Dickerson,	Kendall,	Sayers,
Baker,	Dingley,	Kribbs,	Scott,
Bankhead,	Dockery,	Kyle,	Scull,
Beeman,	Dungan,	Lane,	Seerley,
Belknap,	Edmunds,	Lanham,	Shell,
Bentley,	Ellis,	Layton,	Simpson,
Blanchard,	Enloe,	Lester, Ga.	Smith,
Bland,	Enochs,	Lind,	Snodgrass,
Blount,	Everett,	Livingston,	Snow,
Bowman,	Fithian,	Long,	Stackh'se,
Branch,	Flick,	Lynch,	Stew'd, Ill.
Bretz,	Forman,	Mallory,	Stew't, Tex
Broderick,	Forney,	Martin,	Stone, C. W.
Brookshire,	Funston,	McCreary,	Stone, W. A
Brown,	Fyan,	McKaig,	Stone, Ky.
Bryan,	Gillespie,	McKeighan,	Taylor, E. B
Bullock,	Goodnight,	McKinney,	Tayl'r, J. D.
Bunting,	Gorman,	McRae,	Terry,
Busey,	Grady,	Meredith,	Tillman,
Butler,	Grout,	Montgomery,	Turpin,
Byrns,	Hallowell,	Moore,	Van Horn,
Caminetti,	Halvorson,	Moses,	Watson,
Capehart,	Hamilton,	Oates,	Waugh,
Cate,	Hare,	O'Donnell,	Weadock,
Clark, Wyo.	Harries,	Otis,	Wheeler,
Cobb, Ala.	Hatch,	Owens,	White,
Coburn,	Haynes, Ohio	Pattison, O.	Whiting,
Compton,	Heard,	Patton,	Wike,
Coolidge,	Hemphill,	Paynter,	Willcox,
Cooper,	Henderson, Ia.	Pearson,	Will's, N.C.
Cowles,	Hender'n, N.C.	Peel,	Will'ms, Ill
Cox, N. Y.	Henders'n, Ill.	Perkins,	Wilson, Ky
Cox, Tenn.	Hermann,	Pierce,	Winn,
Craig, Pa.	Holman,	Post,	Wise,
Crawford,	Hopkins, Pa.	Price,	Wolverton
Crosby,	Hopkins, Ill.	Raines,	Youmans.

NAYS—46.

Andrew,	Durborrow,	McAleer,	Randall,
Bacon,	English,	McDonald,	Rayner,
Boatner,	Fellows,	McGann,	Stephen'n,
Brawley,	Greenleaf,	Meyer,	Stevens,
Bushnell,	Griswold,	Mitchell,	Storer,
Caldwell,	Harter,	Mutchler,	Stout,
Campbell,	Herbert,	Newberry,	Tarsney,
Caruth,	Johnson, O.	O'Neil, Mass.	Taylor, Ill.
Cobb, Mo.	Lagan,	O'Neil, Pa.	Tracey,
Covert,	Lapham,	Page, R. I.	Warner.
Cummings,	Lockwood,	Page, Md.	
Dixon,	Loud,	Patterson,	

It will be noted that the New England States cast eight votes for, and six against, while 12 did not vote. New York, seven for, nine against, 18 not voting; New Jersey, two against, five not voting; Pennsylvania, 12 for, four against, 12 not voting; Maryland, two in each class; a total of 21 for, 17 against, and 38 not voting from the Middle States. Out of 99 Southern members, 63 were for, and only seven against, all of the latter being from the cities — remarkable evidence of the strength of the measure among cotton growers. The Central States cast 43 votes for, and only 12 against, out of 74 members; four of the opposition votes were from Chicago. Two members from St. Louis were against, but of the other 41 members from the Missouri Valley States—Iowa, Kansas, Missouri, Nebraska, Minnesota, North Dakota and South Dakota 29 voted for the bill. One San Francisco man and Representative Dixon, of Montana, were alone in voting against the bill from the Mountain and Pacific States. Only seven opponents from south of the Potomac, and four west of the Mississippi, demonstrate the strength of the cause, the other 23 votes against, all coming from representatives from the cities of New England and Middle States.

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Haas' Remedy saved my herd.—A. Burgess, Lewistown, Ill., Feb. 6, '92.

Would not raise hogs without it.—J. W. Jones, Breckenridge, Mo., Mar. 13, '92.

The only reliable medicine we know of.—H. H. Stolze, Emerson, Neb., Apr. '92.

Gives satisfaction in every instance.—B. F. Shouse, Ft. Smith, Ark. May '92.

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JOS. HAAS, V. S., Indianapolis, Ind.

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OUR SPECIAL OFFER

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Below see sample letters from those who have accepted our Special Offer for 1892, have got their Creameries and tested them.

Lyons, Mich., May 6th, 1892.

I received the Creamery. Have tried it. Several neighbors have seen it, like it very much and want them at once. It gets all the cream. It pays to accept the Delaware County Creamery Co.'s offer. You get just what is recommended. *Respectfully, A. A. CRANE.*

Syracuse, Ind., May 6th, 1892.

Your Creamery came. I put it to work. Have been 8 years in hardware trade. Have sold several makes of creameries, but yours is better than any I ever sold, shall want several.

Yours truly, MAT. J. RIPPEY.

THE DELAWARE COUNTY CREAMERY CO. Benton Harbor, MICH.

THE CROP SITUATION.

The Area and Yield of Flax.

According to the census of 1889, flax was grown on 1,319,000 acres in the United States that year producing 10,250,000 bushels of flaxseed, 241,000 pounds of fiber and 208,000 tons of straw, of a total value of $10,436,000. Flax production is one of the curiosities of American agriculture, although its product has never amounted to one-half of one per cent. of the total value of the agricultural products of the country. Its cultivation was first made compulsory in Massachusetts in 1639, in Connecticut in 1640, in Virginia, Pennsylvania and Maryland in 1662. In 1729 there were exported from Pennsylvania to Ireland and Scotland 1,813 bushels of flaxseed, valued at $1.14 per bushel, and within the next 25 years Connecticut, alone, reached an annual export trade of 400,000 bushels of seed valued at $400,000.

The first statistical records of flax production show a yield of 562,000 bushels of seed and 7,710,000 pounds of fiber in 1849. Ten years later the yield was 567,000 bushels of seed and 4,720,000 pounds of fiber, and, at the subsequent census of 1869, the highest output of fiber, 27,133,000 pounds, was reached. The following table shows, by States, the area, yield and value of the product in 1889, with the yield in 1879 and 1869:

	1889.				1879.		1869.	
	AREA.	SEED.	FIBER.	VALUE.	SEED.	FIBER.	SEED.	FIBER.
	Acres.	*Bushels.*	*Pounds.*	*Dollars.*	*Bushels.*	*Pounds.*	*Bushels.*	*Pounds.*
United States	1,318,698	10,250,410	241,389	10,436,228	7,170,951	1,565,546	1,730,444	27,133,034
California	249	4,130	.....	4,910	45,770	.....	13,294	31,740
Colorado	422	1,994	.....	1,960	.....	.....	.....	.....
Idaho	8,002	83,409	.....	81,521	14,901	.....	.....	.....
Illinois	4,672	35,013	57,776	40,766	1,812,438	167,807	280,043	2,204,606
Indiana	2,737	17,566	4,350	19,120	1,419,172	25,181	401,931	37,771
Iowa	230,085	2,282,359	6,281	2,323,974	1,511,131	81,354	88,621	695,518
Kansas	114,069	974,127	36,093	1,008,242	513,616	1,150	1,553	1,040
Kentucky	186	1,321	12,295	1,928	2,192	48,491	14,657	237,268
Michigan	417	3,719	31,610	5,544	2,764	10	5,528	240,110
Minnesota	303,635	2,721,987	8,609	2,811,384	98,689	497	18,635	122,571
Missouri	56,421	450,831	1,458	461,767	379,535	19,452	10,391	16,613
Nebraska	163,900	1,401,104	1,025	1,392,689	77,805	900	404	54
New York	2,922	21,307	15,826	36,880	72,372	843,965	92,519	3,670,818
North Carolina	143	397	3,637	787	503	9,621	6,756	59,552
North Dakota	43,724	164,319	568	158,609	50	.....	.....	.....
Ohio	20,553	145,557	18,377	179,288	593,217	123,367	631,894	17,880,624
Oregon	563	3,871	.....	5,270	21,742	28,199	10,988	40,474
Pennsylvania	517	4,183	173	5,772	5,352	19,896	15,624	815,906
South Dakota	354,951	1,801,114	3,278	1,770,322	26,707	.....	.....	.....
Virginia	131	538	27,133	1,867	4,526	66,264	9,699	130,750
Washington	4,270	42,285	.....	42,131	12,202	25	.....	.....
Wisconsin	5,973	68,227	4,591	79,958	547,104	2,124	112,019	497,398

The manufacture of flax bagging doubled the acreage planted to flax within three years, 1866-69, and the baling of the cotton crop of 1870-71, some 4,347,000 bales, taxed to its utmost the capacity of every bagging mill in the country. The abolition of the import duty on jute butts practically put an end to the bagging industry, the production of fiber gradually diminishing thereafter till it did not amount to 250,000 pounds in 1889. The production of flaxseed, however, has been increasing as that of fiber decreased, the seed product being 10,250,000 bushels in 1889, as compared with 1,730,000 bushels in 1869, and 562,000 bushels in 1849. It will be particularly noticed, from the foregoing table, that those States, which were the first to compel, by law, the cultivation of flax, are now growing little or none. Massachusetts, the pioneer, had only one acre planted to flax in 1889, Connecticut had none, Maryland had one acre, while Virginia has decreased its output, within 40 years, from 52,000 bushels of seed and 1,000,000 pounds of fiber to 131 bushels and 538 pounds respectively, and Pennsylvania in almost the same proportion. The cultivation of this crop has extended West, the bulk being now grown in South Dakota, Minnesota, Iowa, Nebraska and Kansas, with a fair amount in Missouri, North Dakota and Ohio.

Farmers claim that flax is an exhaustive crop, and, as the acreage so planted has diminished, there has been an increased demand for flaxseed at a price rendering the crop more profitable than either wheat or corn, especially when raised on the strong soils of States west of the Mississippi river. This, no doubt, proved to be the case during the present season when seeds were high, flaxseed selling up to $1.50 per bushel. In the census report no attempt has been made to ascertain the separate values of flaxseed straw and fiber, but in States where the sale of straw or fiber realized but little, the average price of the seed to the grower was rather less than $1 per bushel in 1889.

Flax straw appears to be of no value, not being used even for tow or paper making. Much of it is burned, a little being utilized in thatching or as bedding for stock, and, occasionally, for feed, a habit that should be discontinued.

The fiber grown at the present time is largely used as upholstery tow, and cannot be classed with the product of 1860, which was an excellent grade for spinning, and able to hold its own with all but the very finest of imported varieties. The Department of Agriculture is endeavoring, by well-directed efforts, to revive the genuine flax industry, so that the American people, who are the largest consumers of linen in the world, may ultimately become entirely independent of the foreign manufacturer.

In this connection it is of interest to give the value of the imports of textile grasses and fibrous vegetable substances, together with the value of the imported manufactures therefrom, as follows:

NINE MONTHS ENDING MARCH 31ST.

	1892.	1891.
Manufactured.		
Bags and bagging	$ 736,575	$ 437,493
Burlaps	5,283,919	4,041,423
Cordage, twine, etc.	47,678	81,117
Yarns or threads	443,796	825,363
All other	13,389,954	
Unmanufactured		13,369,594
Isle or Tampico fiber	216,086	289,418
Jute, jute butts	1,808,579	1,601,891
Manila	4,994,066	4,702,376
Sisal grass	3,819,850	2,767,539
All other	944,025	1,064,379
Total imports, nine months	$31,684,525	$29,180,593

Less Cotton and Higher Prices.

Returns of statistical correspondents of the Department of Agriculture, between June 1st and 5th, report cotton planting late, germination retarded by low temperature, and slow development of the plant. In the entire cotton belt the temperature of the past three months was reported below normal, in some districts two to three degrees below. Rainfall has also been reported below normal on the Atlantic coast, while generally in excess in the Mississippi valley, both conditions coöperating with low temperature to retard growth. Many correspondents of the Atlantic section report a poor stand. The average condition of cotton, in the consolidation of reports, is 85.9. This is the lowest average, with one exception, since 1874.

The reduction of area from floods resulting from river overflows, especially of the Mississippi and its tributaries, has been heavy. The acreage of cotton has been materially reduced. On the first of May, while planting was progressing, the Department's correspondents reported an intention to reduce acreage 18.6 per cent. The present report of completed acreage makes the reduction 16.5 per cent. The following table gives the average condition and percentage of area of the crop, by States, on June, as compared with last year, for government report:

States.	*Acreage.* 1892.	1891.	*Condition.* 1892.	1891.
Virginia	73	96	79	78
North Carolina	76	94	88	75
South Carolina	84	96	91	80
Georgia	84	95	87	80
Florida	81	99	89	90
Alabama	84	96	91	89
Mississippi	85	95	91	88
Louisiana	80	96	82	88
Texas	85	105	81	91
Arkansas	82	96	75	89
Tennessee	83	95	90	73
Averages	83.5	97.7	85.9	85.7

Against an area 16½ per cent. less than last year, the *Financial Chronicle* (the cotton exchange authority) estimates 12 per cent. and Bradstreet 20 per cent. reduction. Applying the June 1st government returns and our own reports to our carefully corrected data of the 1891 acreage, printed on Page 395 of our June number, the AMERICAN AGRICULTURIST makes the decrease 14 per cent. The details of our estimate and the *Chronicle's* figures thus compare, last three figures (000s) omitted:

States.	*Agriculturist.* *Acres'92*	*Dec. %*	*Chronicle.* *Acres'92*	*Dec. %*
North Carolina	932	17	814	26
South Carolina	1,709	13	1,502	10
Georgia	2,973	12	2,760	8
Florida	190	18	218	20
Tennessee	637	10	871	10
Arkansas	1,373	15	1,198	20
Alabama	2,445	13	2,829	6
Mississippi	2,669	11	2,650	9
Louisiana	997	14	933	15
Texas, etc.	2,754	21	4,535	15
Total	16,679	14	18,310	12

The difference in the estimate of reduction is only two per cent., but the *Chronicle* applies its estimates to its own figures of acreage last year, which were 20,779,000 acres, against 19,352,000, our deduction from Department and Census returns. The discrepancy of over 1,500,000 acres in the two estimates for 1892 occurs in Texas mainly. It shows the necessity of an accurate census of 1892 acres to arrive at the real truth.

Admit that nearer 18 than 17 million acres are in cotton this year. The average for the past 12 years is just about 18 million acres and under 7,000,000 bales. With a full average yield, therefore, can we expect more than 7,500,000 bales for the new crop? Such a crop would be fully 1,500,000 bales less than last year. Would not a decrease in yield of 15 to 20 per cent. from last year mean a corresponding increase in price?

Is not the prospect fair that the 1892 crop will sell at the plantation for one to three cents per pound more than the last cotton crop?

Other Staple Crops.

The Rye Outlook.—In view of the high prices received for last year's rye crop, due to the shortage in Russia and Germany, it is surprising that the area in rye in the United States was not much enlarged this season. The Department reports it as 0.8 of one per cent. less than last year, or 99.2 per cent. The condition of the crop on June 1st was 91, a gain of two points since last month. This insures a full average yield of winter rye, which will be harvested about the time this reaches the reader, and promises favorably for spring rye.

The Acreage of Barley in the United States is 2.3 per cent. larger than last year. This is a much greater increase than usual, and is ascribed to the improved market for domestic barley caused by the partial exclusion of quantities of Canadian barley by the high tariff. The condition of growing barley June 1st was 92.1 for the United States on a basis of 100 as perfection; New York 93, Ohio 92, Michigan 84, Indiana 88, Illinois 91, Wisconsin 95, Minnesota 92, Iowa 90, Nebraska 84, California 92.

The Oat Crop may be less than last year. The breadth is reduced about 2,500,000 acres, only about 23,000,000 acres being sown, if the government report for June of 99.1 per cent. on acreage is accepted as correct. Should the crop give the usual average yield of 25 bushels per acre, the decrease would be some 65,000,000 bushels in a crop which last year went 29 bushels per acre and made a total product of 738 million bushels. Condition on June 1st a year ago was only 85, whereas this year it is 88.

The Clover Area is nearly the same as in June of last year, and condition is 94.9, or nearly four points better than one year ago.

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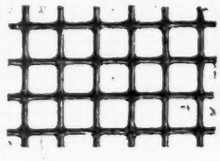

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The Growing Wheat Crop.

The acreage of winter wheat, based on returns to the Department of Agriculture on June 1st, is 99.9 per cent. of the actual area of last year. There is a small increase in several of the Southern States, and an enlargement in Nebraska of 21 per cent. in winter wheat. The percentage of the spring wheat area is 100.3. The percentage of Iowa is 96, Minnesota 102, North Dakota 85, South Dakota 118, Nebraska 107.

The aggregate acreage of both winter and spring wheat is thus but slightly in excess of last year's breadth. Applying the Departments percentage estimates for each State, we find a total of 39,467,000 acres in wheat this year, against 39,917,000 acres last year. The increase has been greatest in the States of minor importance in cereal production, which do not grow wheat enough for home consumption. This fact has not been noted by the shortsellers, who have used the June report as a lever for knocking down prices. The AMERICAN AGRICULTURIST estimate below confirms this point by showing that the great surplus wheat States—Ohio, Michigan, Indiana, Illinois, Minnesota, Iowa, Missouri, Kansas, California, and the Dakotas—have only 26,159,000 acres under wheat this year, compared with 27,200,000 acres last year. These States furnished 445 millions of the 612,000,000 bushels of wheat grown in the United States last year. Their reduction of over one million acres means at least 15 to 20 million bushels less than their 1891 crop, even if the current season should prove as perfect as last year.

But we find that condition in these States returned for June makes an average of only 89, against 96 last year. It will be noted in the table below that condition was furthest below last year in States of largest production. While it is too early to forecast results, the decreased acreage and poorer June condition indicate a crop in these surplus States 40 to 50 million bushels less than last year. Condition improved much in the central West during May, especially in Ohio; also in Kansas, while the crop is in prime condition on the Pacific slope.

The Department's return of condition of winter wheat was 88.3 against 96.6 in June last year, and for spring wheat 92.3 against 92.6 last year. Everything points to a crop of winter wheat considerably less than last year, but a somewhat larger yield of spring wheat. As the latter is grown on only half as many acres, the increase of spring can hardly make up for the decreased yield of winter wheat. The June report, therefore, indicates a total wheat crop of about 550,000,000 bushels.

In the following table we estimate the acreage of winter and spring wheat from Department returns, also condition June 1st, for both this year and last. Our figures of condition are the average of both spring and winter wheat in States where both are grown, which makes a slight variation from the official report. Our estimates of acreage are in thousands, the last three figures omitted:

States and Territories	*Win. acres* 1892.	*Wh't. acres* 1891.	*Spr'g acres* 1892.	*Wh't. acres* 1891.	*Total acres.* 1892.	1891.	*Con. Jun* '92	1 '91
New Eng'd	31	31	43	43	74	74	96	96
New York.	518	512	122	128	639	641	97	96
New Jers'y	139	139	.....	.....	139	139	95	97
Penn.....	1,020	1,030	301	308	1,321	1,337	89	97
Michigan .	1,001	1,011	50	55	1,050	1,067	86	90
Illinois....	1,850	1,887	55	58	1,905	1,945	86	98
Wisconsin.	482	548	402	418	884	966	86	77
Minnesota.	100	104	3,101	3,040	3,201	3,144	90	89
Iowa	312	312	1,431	1,491	1,743	1,803	87	95
Nebraska..	241	199	1,077	1,006	1,318	1,205	94	97
California.	2,934	2,742	73	73	3,007	2,815	98	97
Oregon	308	308	380	384	688	692	98	98
Nevada....	3	4	17	17	20	20	93	96
Colorado...	11	11	100	90	112	101	93	100
Arizona ...	23	24	3	3	27	27	91	99
Idaho	5	6	84	85	90	91	85	100
Montana ..	2	2	96	91	97	93	95	100
New Mex..	3	4	91	90	94	93	86	100
Utah	48	45	95	91	143	137	95	99
Washingtn	360	332	433	376	793	698	96	96
No. Dakota	.....	.....	2,488	2,927	2,488	2,927	92	96
So. Dakota	.....	.....	2,307	1,955	2,307	1,955	95	96
Wyoming..	.....	.....	6	6	6	6	95	..
Delaware..	101	98	.....	.....	101	98	94	91
Maryland .	49	540	.....	.....	49	540	93	93
Virginia ...	842	850	.....	.....	842	850	92	95
N. Carolina	776	732	.....	.....	776	732	95	96
S. Carolina	198	180	.....	.....	198	180	96	92
Georgia ...	331	310	.....	.....	331	310	98	98
Alabama ..	293	281	.....	.....	293	281	96	88
Mississippi	63	62	.....	.....	63	62	93	92
Texas	574	537	.....	.....	574	537	93	98
Arkansas..	240	233	.....	.....	240	233	93	99
Tennessee	1,075	1,199	.....	.....	1,075	1,199	93	99
W.Virginia	332	332	.....	.....	332	332	94	89
Kentucky..	1,142	1,038	.....	.....	1,142	1,038	95	96
Ohio	2,716	2,667	.....	.....	2,716	2,667	84	99
Indiana ...	2,626	2,918	.....	.....	2,626	2,918	87	99
Missouri...	1,646	1,892	.....	.....	1,646	1,892	75	99
Kansas	3,469	3,540	.....	.....	3,469	3,540	87	95
Totals ...	25,864	26,344	13,603	13,562	39,467	39,916	92	95

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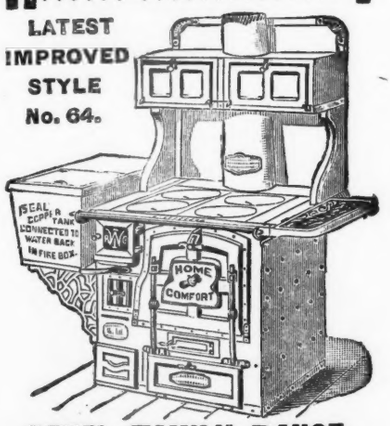

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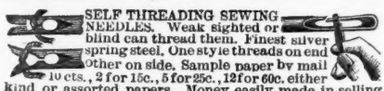

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ANIMAL AILMENTS.

The American Ox Bot or Warble.

DR. C. V. RILEY.

[Entomologist to the United States Department of Agriculture.]

At the meeting of the Washington Entomological Society in May, 1891, I presented a paper on the American Ox Warble, or the larva of Hypoderma, which affects cattle in the United States. The facts and conclusions here given were presented on that occasion, but are not yet published. Quite recently, however, I have been able to add some further confirmatory facts and observations which enable me to give some conclusive statements with regard to this insect, that are contrary to the ideas which, until within the last year, have prevailed. The differences in habit and characters between the well-known *Hypoderma bovis*, or the European ox bot, and *H. lineata*, which also occurs in Europe and in this country, are based on an interesting paper by Dr. F. Brauer,* on investigations by Dr. Cooper Curtice, and on my own observations. Dr. Curtice's investigations, as well as my own, are based on material in the United States National Museum, and in the possession of the Bureau of Animal Industry of the Department of Agriculture. Chiefly through some discoveries of Dr. Adam Handlirsch, Dr. Brauer has been enabled to show that *lineata* occurs in Europe often in the same region as *bovis*, and sometimes on the same animal. Specimens have been obtained in Europe from Brescia, near the Tyrol, in Norway, the Crimea, the Balkans, the Caucasus, in Dalmatia and in England. In North America, Brauer quotes it from Texas, and, upon the authority of Williston, as ranging to Arizona and Northern California. Walker has described it from Nova Scotia as *Oestrus supplens*, and the interesting fact is brought out that it inhabits our buffalo. Specimens in the National museum include a number received from correspondents in Texas as the "Heel Fly," two of the same popular name from New Jersey, and others from Southern Georgia, Colorado, Arkansas, and Texas. They all confirm the reference of the so-called heel fly to *lineata*.

So far as this museum material is concerned, it seems that *lineata* is the common species of Hypoderma with us, and, in fact, not a single typical specimen of *bovis* is accessible. Generalizing from these facts, as illustrated by the material in the National museum, Dr. Cooper Curtice came to the conclusion that *bovis* does not occur in North America. I have been much interested in endeavoring to ascertain whether this conclusion was justified or not, and so far as I have been able to gather from correspondents, the typical *bovis* exists in none of the collections in this country. Thus, so far as the facts hitherto obtained furnish any evidence, Dr. Curtice's conclusions are justified, though it seems almost incredible that the European *bovis* has not been brought over with the cattle importations that have been made ever since the settlement of the country. I shall be very glad to receive from anyone under whose eyes this may fall, specimens of the warbles when about to mature, or of the flies, from any locality within the United States.

Dr. Cooper Curtice has raised, in *Insect Life*, the question whether the larvae of Hypoderma are taken through the mouth, and subsequently penetrate to the skin. Upon this point it may be stated positively that all the larvae of Hypoderma which he found in the œsophageal walls of cattle are those of *lineata*, and this exceptional position of the larvae of this species is connected with the habit of the perfect fly of affecting, and, as I have recently discovered, of ovipositing upon the heels of cattle.

Strange as it may seem, though the egg of both the European *Hypoderma bovis* and of our own *H. lineata* have been described, the manner in which the egg is laid has never yet been recorded. I have recently had the good fortune to ascertain that the eggs of *H. lineata* are laid in rows obliquely fastened to the hair, especially on the fetlock and heel. This fact tends to strengthen and confirm the position taken by Dr. Curtice, and it would seem that the normal habit of the species is to lay its eggs not on the back, as has been

*Verhandlungen der Kaiserlichen-koeniglichen Zoologisch-botanischen Gesellschaft in Wien, 1890. Seite 590. "Ueber die Feststellung des Wohnthieres der *Hypoderma lineata* Villers durch Dr. Adam Handlirsch und andere Untersuchungen und Beobachten an Oestriden."

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ANIMAL AILMENTS.

supposed, but around those parts which can be readily licked. The larva, when first hatched, is pretty generally covered with minute spines which admirably fit it for adhering tenaciously to the tongue and mucous mouth-parts, and for working its way into the œsophagus, but after the first molt, which soon takes place, it becomes absolutely smooth, and it is, undoubtedly, in this smooth stage that it penetrates the muscular tissues, and works its way to the back. These facts are most interesting, and they naturally raise the question as to whether or not the European *Hypoderma bovis* has not the same habit, and whether in two insects so closely allied we shall have in the one case the larva entering through the mouth, and in the other working its way directly into the skin from an egg laid on the back. The presumption is that the former habit is shared by both species.

Temporary Shelter for a Tethered Cow. — J. H. F., Baltimore, Maryland: It would not be difficult to provide a shelter from the sun for a cow that is tethered in a pasture, by means of a light frame, held on a pole in the center and covered with a sheet of heavy cotton cloth or duck. The whole could be removed together, or taken down and reset, by making a hole in the ground with a bar and setting the center post firmly in it. Such a pole as is used for a hop plant would be stout enough. Of course it should be set on one side of the cow's limit, and the south side, so that she could be in the shade and not tangle up the tether with the pole. Only enough space is given to permit the cow to lie in the shade. By good management it would not be necessary to move the shelter every time the cow is moved.

How to See With a Telescope.

No one thinks that any instructions are needed in the use of a telescope. It is for this reason that people so often say, "I never can see anything with them," or "I can see almost as well with one as without." These remarks are true, because most people cannot adjust them so as to get clear vision.

The first thing to be done, in using a telescope, is to "focus" it. That is, to adjust the distance between the front and back lenses to suit the eye. This distance varies with the distance of the object and with different persons. Most telescopes, when adjusted for a mile, will show objects half a mile away as well as those much further away. Two or three adjustments will practically cover all distances. To focus, draw the telescope out to its full length. Then rest the hand upon a firm support, if possible, and point the instrument at the object. With a twisting motion push the small tube in slowly. The object will appear to grow more and more clear. After reaching its best it will become dim and hazy. Reverse the motion and watch for the point at which the object begins to grow hazy. Half way between the two points where it seemed to be hazy or blurred will be the best focus for that object and the observer's eye. Eyes, of course, differ much. It is well to focus your telescope on the extreme distance for objects very near, and for the distance at which the most observing will be done. Mark each focus by a fine scratch on the tube. Two or three marks only are needed. When made, the instrument can be focussed as it is opened. Do not look closely through an instrument until certain the focus suits your eye. When looking through a strange instrument, try whether the focus suits your eye by moving the tube a little. The marked tube, therefore, saves trouble.

With the glass well focussed, we are ready to learn how to see. Lesson first is to learn to use one eye easily, while the other is shut. Better still, keep both eyes open, and let the hand come in front of the one not in use. Master this, and then, on a clear day, begin the second lesson. At a distance there is a moving speck. Study it without the glass. It seems a grain of white. Looking closer, the end wiggles as it moves forward. Now get the glass. The speck is a white horse. The wiggle is the motion of the head. Try a dark speck on some field a mile and a half away. It looks not larger than the dot of an "i" on this page. Perhaps, by careful watching, you see at one side a puff of smoke at intervals. When you can find out no more take the glass. Then the speck becomes a man sowing seed or dusting a crop. Every time a thing at a distance is plainly recognized through the glass, examine it carefully with the naked eye. See how it differs from other specks and dots, though only a dot itself. Learn the flash of the reaper rakes when the machine is so far away you can scarcely see the team. Help the eye with the glass, and then make sure of all you can possibly see without. Trained thus, when these same appearances are seen in the telescope, you will know what they mean. Those with less experience will give you credit for wonderful eyesight. When the sailor sees on the horizon three pale crescents, smaller than any dot on this page, he says, "a full-rigged ship going before the wind." Not that he sees the details. His glass has shown him that the faint signs mean such things. These principles of observing apply to things three rods away, as well as to great distances. A neighbor's face, the different farm animals, are recognized in the same way. Use the eye first, then the glass, and then the eye. Each then helps the other.

The power of the glass offered as a premium with the AMERICAN AGRICULTURIST is, as nearly as possible, 12 diameters. Thus, objects appear 12 times as large as when seen by the eye alone. They seem one-twelfth the actual distance away. To measure its power for one's self, rest the glass on something and look at a picket fence 10 rods away. You can see two fences, one through the glass, one direct. One picket, through the glass, seems to cover 12 seen with the naked eye. There is a little trick to do it, but a little practice will show how it's done. The power of the glass is more than twice as great as that of the best or largest opera or "field" glasses. Because of its great power and smaller diameter, objects are not as bright as when seen through a field glass or with the naked eye. This form of glass is, therefore, not much used at night. As we can use both eyes with a "night," or "field glass," and as the lenses are very large, it will show objects utterly invisible to the naked eye. Its usual magnifying power is only four or five diameters. It is useful for giving pretty pictures of distant objects. Its small power can be seen by comparing the distance at which a newspaper can be read with it and with the AMERICAN AGRICULTURIST telescope.

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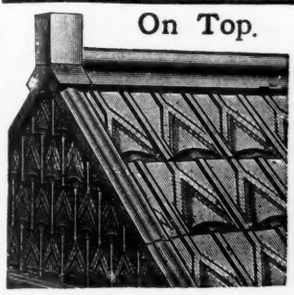

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JULY, 1892.

A Righteous Cause.

The extent to which the commercial world fails to comprehend the anti-option bill is most astonishing. It is evidently due to the desperate efforts the bucket-shop gamblers are making to prejudice bankers, manufacturers and consumers of cotton and cereals against the measure.

In the first place, the Washburn-Hatch bill is designed to simply tax out of existence the gambling in options and futures that is now against the rules of even the Chicago Board of Trade, and is generally known by the term bucket-shop gambling. It is because the Boards of Trade do not live up to their own rules against this traffic that the bill is pending. If the anti-option bill becomes a law it will not interfere in any way with the buying of actual cotton, grain, hops or swine products for either immediate or future delivery.

The law would put business in these articles on the same basis as the wool trade is now, and as most other lines of business are. Wool is bought from the producers by middlemen or agents, and is sold to consumers, or manufacturers. In these transactions the actual wool only is bought and sold, and prices are governed by the law of supply and demand. The warehouse receipt for wool is more acceptable as banking collateral than warehouse receipts for cotton or grain, because wool is free from the sudden fluctuations in prices due to the speculation on margins which the bill is designed to stamp out. Bankers who are not engaged in gambling on margins for their customers, but who confine themselves to the legitimate business of loaning money, have only to realize how the anti-option bill will benefit the value of warehouse receipts as collateral security to become earnest advocates of the measure.

Because the wool market is comparatively free from these gambling manipulations, prices of wool are comparatively steady from the time the new clip is quoted until another new crop comes on the market. The great claim for the evil system of dealing in futures and options is that it steadies the market and benefits farmers by spreading their sales over a long period. This claim has no foundation in fact. Non-perishable articles like wool, cotton and grain can be stored on the farm cheaper than anywhere else. If the farmers' need of money compels them to rush their produce to market, they are bound to do so, and all the gambling on margins will not supply their need of money.

Nor is there any truth in the assertion that an anti-option law would drive the cotton business to Liverpool and the grain business to Canada. Even admitting that it drove the gambling, pure and simple, to those places, this would have no material effect on the market. Indeed, we want to drive this species of gambling out of the country. It would leave consumers at home and abroad free to buy grain and cotton in our American markets, which would then set the prices for the world, because ruled by supply and demand.

As a matter of fact, the English trade does not favor this gambling system, and some of the leading English houses have already cabled instructions to their agents here to withdraw from the option business, into which they had been driven by their competitors. Thus those really injured by the bill are simply the brokers who now realize the same fees for effecting transactions in fiat produce that legitimate commission merchants charge for handling actual cotton or grain. Hence, legitimate business being relieved of these charges on phantom sales, a further burden will be disposed of and producers and consumers will share the saving.

To set up the claim that the speculation on margins is essential to modern business methods is to make an assertion that is fallacious on its face. This is shown by the fact that the system of gambling in phantom goods now applied to grain and cotton has been practically abolished in the business of selling stocks and bonds in all the great cities of the world. Even the San Francisco Mining Stock Exchange has forbidden the practice. Moreover, not 10 per cent. of the cereal crops of the country are handled by the Produce Exchange cities whose speculators' dealings on margins fix the prices for the other nine-tenths. Chicago, for instance, handled less than four per cent. of the cereal crops of 1890, and yet her gamblers set the price on every farm in the country. And New York, the great center of cotton gambling, received only 87,000 bales of cotton during the nine months ended June 1st out of a total movement exceeding 7,000,000 bales; her sales of spot cotton for actual delivery were only 122,000 bales during this time, while nearly 26,000,000 bales of futures or fiat cotton were sold; and, including cotton which passed through New York in transit for export, this city handled less than one-tenth of the crop, yet fixed values for the world.

A striking instance of the evils of gambling on margins is furnished by the broken firm of Coster, Martin & Co., of Chicago. After depressing the price of corn for delivery in May to the utmost limit, they undertook to buy all the corn in sight and insisted on the delivery of the actual grain from all with whom they had contracts, unless these parties would settle at $1 a bushel—that is, pay Coster, Martin & Co. the difference between the price on the day the firm made the trade and $1—a margin of from 20 to 40 cents per bushel. The sellers, however, were in this case able to furnish the actual corn faster than the firm could buy it, and Coster, Martin & Co. failed on the spot. As a result, the price of corn dropped from $1 per bushel to 50 cents in two minutes. Yet they were able to thus manipulate the market for a crop valued at $850,000,000 with a capital of only $100,000!

The anti-option bill aims to eradicate this evil without interfering with legitimate trade. It is, therefore, worthy of a careful trial. It will be better to amend the law if found faulty, or even to repeal it if it does not satisfactorily fulfill its purpose, than to have producers and consumers longer bear this intolerable burden of gamblers' fees and manipulations.

A Partial Victory.

The manner in which the National House of Representatives passed the Washburn-Hatch anti-option bill by an overwhelming vote is fully described on a preceding page. The significance of the victory is shown by the analysis of the vote at the conclusion of the article referred to. Not for years has a measure passed the House by such a large majority, whether considered numerically or as representing so large a portion of the United States. Indeed, only a handful of members, and these from the Board of Trade cities, were recorded against the bill.

The result proves how fully the producing and consuming interests of the entire country agree with the AMERICAN AGRICULTURIST in the belief that this effort to stamp out the evil of gambling in farm products is worthy of a thorough trial. It is needless to add that the speculative gambling fraternity was shocked by the tremendous support accorded the bill on the final vote in the House. These manipulators of market values and of the currency have been so long accustomed to defeating any legislation designed to restrict their special privileges in the interests of the common people, that they were dumbfounded at such a Waterloo.

Recovering from their defeat, the whole organization of speculators, brokers and bankers who have been fattening on this species of gambling, have marshalled their forces against the bill in the Senate. They will exert more direct pressure upon Senators than has been employed for years. The contest over the tariff bill was as naught, in the Senate, at least, compared to the influences that will be brought to bear against the anti-option bill. The power of the opposition cannot be exaggerated.

At this juncture farmers and other friends of the measure can do but one thing: Send telegrams and letters to both their Senators at Washington to stand by the bill firmly—to work for it and vote for it. If this be done universally, each Senator will receive dispatches, letters and postals from so many thousands of his constituents that he will at once see that the opposition is confined to only a limited number for selfish purposes, and that the measure is demanded by and in the interests of the sovereign people. Unless this suggestion is acted upon by our readers and others, with instant earnestness, the Senate will kill the bill.

God Bless You. — The grand, old, welcome AMERICAN AGRICULTURIST in its new dress is so well filled with precious matter that it recalls sacred memories of the past, and presages still greater anticipations for the future. May God bless you and your good work.

GEORGE A. HALL, Paulding Co., Ohio.

Each Number of More Value Than a Year's Subscription.— I have been a subscriber to the AMERICAN AGRICULTURIST for about 20 years, and have always found in each number something that was of more value by far than a year's subscription. T. MABBETT, Bermuda Islands.

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Useful and Helpful Notes.

The Beveridge Automatic Cooker.—Notice of this convenient and expeditious method of cooking has been given in our June number. While the company has an office in New York and one in Chicago, its factory and main office is No. 305 S. Sharp street, Baltimore, Md.

The Berger Mfg. Co., Canton, Ohio. — This house issues a remarkably neat and interesting catalogue of their steel roofing, eaves troughs, corrugated iron siding, ceiling, shutters, etc. The handsome, colored plate of one of their patent ceilings deserves special mention.

The Improved Knapsack Sprayer. — The Deming Co., Salem, O., inform us that they have just put on the market the Improved Galloway Knapsack Sprayer, which cannot fail to give satisfaction. Their illustrated and descriptive circular will be sent to all on application who will mention the AMERICAN AGRICULTURIST.

The Champion. — The neat and artistic catalogue of the Famous Mfg. Co., Chicago, Ill., forms a highly interesting pamphlet. All the various baling presses, belt and lever powers manufactured by this company are accurately depicted and described. To those who have not made a special study of this subject, it will be a surprise to find how great and varied is the variety of presses and powers manufactured by this company. All the machines are guaranteed, and the motto of the firm is, "To Please and Satisfy."

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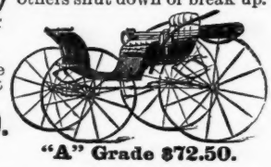

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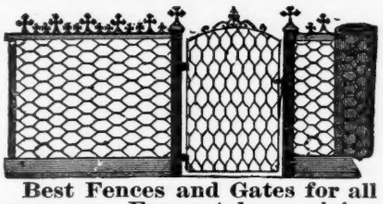

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MIDY MORGAN AT THE AGE OF FIFTY-TWO.

The Late Midy Morgan.

The pages of the AMERICAN AGRICULTURIST have for many years been enriched by the contributions of "*Midy*" Morgan and our readers will regret to learn of her death, which occurred in Jersey City, June 1st. She was in the sixty-fourth year of her age.

Miss Morgan—who was christened Maria, but always bore the diminutive of her childhood—was born in the south of Ireland, the daughter of a country gentleman. As a child she was very active, fearless and fond of outdoor sports, and before she had attained her tenth year she had learned to ride with the foremost after the hounds. Her early and innate fondness for horses grew with her growth, and furnished the keynote of a career, of which the history would read more like romance than plain, everyday fact. She was uncommonly tall, and, for one who knew her only in recent years, with her stately form, unbent by the burden of three-score years, clear, expressive blue eyes, and well-formed features it was easy to imagine how striking a figure she must have been on horseback in the days of her young womanhood. Those days were soon overshadowed by the death of her father, upon which event the estate descended by law to her elder brother.

Her sister Jane had strong artistic proclivities; Miss Midy accompanied her to Rome, and remained there for two years, while the younger sister pursued her art studies. During her life in Rome she became the intimate friend of Harriet Hosmer, the American sculptor, who is also a great lover of horses, and at that time owned a fine stable of them. At the end of the two years in Rome she went to Florence, which was then the seat of the royal government. Her fame as an equestrienne had preceded her, and, when King Victor Emanuel learned of her presence in Florence, she was by royal invitation, presented to him by the British Ambassador, Sir Stratford Canning (afterward Viscount Stratford de Redcliffe). The king received her very graciously, laid aside all ceremony and directed her to be seated, while he sat and had a long chat with her on horse matters. She was soon afterward appointed director of the royal stables. She held the position for several years, during which she made repeated visits to England and Ireland, for the purchase of horses. Her Florentine home was in the household of a titled Italian lady, whose husband was an officer of the king's guards. So well did she perform the duties with which she was intrusted that the king presented her with a diamond star and a gold watch having on its case his monogram in diamonds.

In 1869 she came to the United States bearing letters of introduction from Hon. Geo. P. Marsh, United States Minister to Italy, and others. Her reception in New York was not of an encouraging character. Still, it may be said, to the credit of New York manhood, that the only downright rudeness offered her was at the office of a woman's journal, edited and conducted by women. Henry J. Raymond, to whom one of her letters was addressed, had died suddenly before her arrival, and his successor in the editorial chair of the New York *Times* was John Bigelow, who offered her the position of live-stock-market reporter. She shrank somewhat from the unaccustomed field of journalism, but as she afterward explained it, "I had the choice of attempting that at $20 a week, or running a sewing machine at six dollars." She accepted the place on the *Times*, and while she lived, performed its duties with distinguished ability and success. Her advent in the cattle markets as reporter was greeted with bitter and unmanly sneers. An Associated Press dispatch announced, "The coming woman has come, and taken her place at the stock yards." It was not long before the authors of all the jeers learned to respect her as a modest, conscientious and very competent worker in the field which they had regarded as exclusively their own. For more than 20 years Miss Morgan has devoted herself to her chosen work with zeal, energy and distinguished success. In addition to reporting live-stock markets and races, she has been a regular contributor to the AMERICAN AGRICULTURIST and other periodicals. Her writings were marked by clear and vigorous thought, expressed in piquant and forcible style. Turf magnates and "cattle barons" learned to attach great weight to her opinions and to look to her as an authority. Those who saw her only during her busy hours could have but little idea of how interesting she was in the social circle. She could relate incidents of her varied experience, in a quaint and picturesque manner which held every listener. During her New York life she made repeated visits to Europe, the last one in 1889. The constant companion of her life was her artist sister, Jane. For several years a house has been in course of construction for them, on Staten Island, Midy paying the bills and giving general directions, and the younger sister executing the decorations. In another year she hoped to retire from newspaper life, and enjoy in the Staten Island house the well-earned fortune she had accumulated. But she was attacked with dropsy and, early in May, went for treatment to St. Francis Hospital, Jersey City. Here she expired just as June came in.

Her life is full of lessons for the hesitating and timorous. Instead of clamoring for her rights she quietly took them, and taught all to respect her possession. Pressing boldly into a field of labor which seemed peculiarly unfitted for female effort, she won in it eminent success, and always kept her pure, high womanhood untarnished.

Death of D. D. T. Moore.—As we close our last forms for the presses, news comes of the death of D. D. T. Moore, Ex-mayor of Rochester, N. Y., and the founder of Moore's *Rural New Yorker*. A sketch of his life and work, as well as an accurate portrait of him, will appear in our next issue.

Practical Agricultural Lectures.—An unusually interesting series of lectures on agricultural topics has been given at the Ohio State University during the past year by prominent farmers of the State. These lectures are designed primarily for the agricultural students of the University, but have also been listened to with interest by other students, and by many members of the faculty. The University is fortunate in the fact that there are a large number of successful farmers in the State upon whom it can draw, and it is hoped that from year to year many of them may consent to take part in this series of lectures. The students are much benefited by the practical talks of successful men who give them the results of their ripe experience, and especially in coming in contact with men who have an enthusiasm for their calling. The example is worthy of imitation in all our agricultural colleges.

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Worthy of Notice.

Bees.—Send your name for free samples of bee veils, comb foundation, advice to beginners, and circulars of bee book, smokers, etc., or send eight one-cent stamps for a 24-pamphlet on *Taming and Handling Bees*, to Dadant & Son, Hamilton, Ill.

A Salary—With expenses paid, will come handy to any one who is now out of employment, especially where no previous experience is required to get the position. If you want a position, see advertisement on page 458, headed, "A Chance to Make Money."

The W. C. Leffel Co., Springfield, Ohio.—Under this firm name will be known in future the former firm of the Leffel Water Wheel & Engine Co., which name has been found too long and inconvenient for business purposes. But no matter what change may have occurred in the firm name, the excellence of the machinery sent out from this establishment will be firmly maintained.

Graphite Productions.—Few persons are aware to how many uses graphite is adapted. The Dixon American graphite pencils have long held world-wide reputation, but in addition to these the Jos. Dixon Crucible Co., Jersey City, N. J., manufacture an endless variety of articles from graphite, all of which are plainly described and illustrated in the catalogue of the company, which may be obtained free by mentioning the AMERICAN AGRICULTURIST.

Great Opportunities—The Chicago, Burlington & Quincy Railroad Co. has just issued a neat pamphlet entitled Great Opportunities for Farmers, Business Men, and Investors in Nebraska, Northwestern Kansas and Eastern Colorado. This has been compiled with a great deal of care, and will be found accurate. The elaborate map, which accompanies it, is of special interest and value. Copies of this pamphlet will be mailed free to readers of the AMERICAN AGRICULTURIST by addressing P. S. Eustis, Gen. Pas. Agent, C. B. & Q. Railroad, Chicago, Ill.

Prosperity of Kansas.—The State of Kansas is again attracting the attention of farmers throughout the country because of its series of successful crops in the past three years. In view of the large movement of agriculturists into that State, the Land Department of the Santa Fe Road is having prepared a new folder descriptive of the resources of the State, with revised maps, reliable statistics and other information. Anyone interested in this can obtain a copy free, by making written application to John J. Byrne, Assistant Passenger Traffic Manager, Atchison, Topeka & Santa Fe R. R., Chicago, Ill.

Hogology may be termed the science pertaining to swine raising. The word was coined and copyrighted by Dr. Haas as title for his booklet, giving practical information about pork growing. The booklet contains scientific facts that should be known by every swine raiser, as they are vital to his success. It will pay our readers to send a two-cent stamp to Jos. Haas, V. S., Indianapolis, Ind., for a copy.

Wood Ashes.—The great fertilizing qualities of unleached hardwood ashes are recognized by every intelligent farmer. The reason some farmers have not found them as valuable as they expected is, that unscrupulous parties have sold an inferior article. They have palmed off leached ashes for the genuine article. We have ourselves used large quantities of wood ashes, and have always found that they brought a profitable return. Munroe, De Forest & Co., Oswego, N. Y., sell only the best, and those in need of a quick potash fertilizer will do well to send for their circular.

Buggies and Harness for Farmers.—The "Banner" buggies and harness made by the Kemper Manufacturing Co., Cincinnati, O., are having a wonderful sale. Their goods have many points of excellence, and a sample of them will be sure to show that their claims are just, and the goods will be found the best. Their low prices are due to their making these goods by the thousands. Those who want style, and at the same time a good serviceable article at the lowest possible price, should write them for their free illustrated catalogue, mentioning the AMERICAN AGRICULTURIST.

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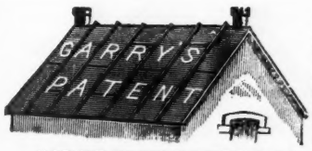

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Veterinary Advice.

Tuberculosis in Heifer.—R. E. Covert, Suffolk Co., N. Y., writes us, "I have a thoroughbred Jersey heifer two years old, just calved this spring. She is in good condition, and seems well, but has a cough which she has had since last winter. She coughs seven or eight times a day, but has no special time of coughing; she has a good appetite, but last winter her bowels were quite loose. It does not affect her in any way, that I can see. She is let to run in the yard daytime, but put up in the barn at night." In the absence of an examination, by percussion, auscultation, and otherwise, it would be impossible to positively diagnose the case. It is probably not contagious, though the milk may not be perfectly healthy, because no signs of contagion have been stated, if they do exist. The regular number of coughing spells are so numerous—seven or eight per day—that the case seems suspicious. Then the long diarrhœa last winter, now replaced by milking, has a suspicion of a vicarious drain upon the system. But against these, not altogether well-founded, suspicions, comes up the fact that the heifer has a good appetite and is in good condition. The glands of the air passages may be somewhat affected with tubercle. But in all obscure cases an educated veterinarian should be consulted.

Stomach Cough.—A. J. Thomaston, Rhode Island, has a valuable carriage horse that has what the veterinarian calls a stomach cough. But the term seem strange to him and he asks if there is any such cough. Certainly there is. Any irritation of the delicate nerves of the digestive system, from bad or indigestible food, or from a foreign body in the stomach or bowels, would produce a cough. Children who are afflicted with worms have a peculiar hack, or cough. This is so with fowls and other animals that have their systems irritated with bad and indigestible food. Nearly all animals are liable to this kind of sympathetic cough.

Spasmodic Asthma in the Horse.—A most interesting case of spasmodic asthma is reported by Seward Hewett, Polk Co., North Carolina. There is also associated with this case a peculiar influence of the seasons. S. H. informs us that there appears to be an obstruction in the mouth or nose. The horse is as bad in the stable as when at work, but the breathing, on going up hill, is thick and labored. The description gives all the symptoms of incurable heaves—heaving flanks, short and labored respiration, dry and unsatisfactory cough, though at times, after a discharge of mucous, the breathing is relieved temporarily. But the strange part of the case is that there is perfect freedom from all difficulty of breathing in cold weather, always returning with warm weather. Some persons, and some horses, subject to asthma, suffer in special localities, and are free in others only a few miles distant. The army veterinarians witnessed many strange cases among horses during the war, and the surgeons reported peculiar cases of spasmodic asthma among the troops. A case of this kind came under our personal observation. A contractor invariably suffered distressingly from asthma on approaching Mobjack Bay and at Fortress Monroe, but once past that point towards Baltimore perfect relief came and continued till the same locality was again approached, with similar discomfort. The only thing that can be suggested, in the case of the horse, is change of location. It is possible that a mountain region might effect a cure.

Black Tooth in Pig.—E. W. Clayton, Weber Co., Utah, asks if there is such a disease in hogs as black tooth. He lost seven pigs. They did well until three weeks old, when they began to look poorly, got thin, appeared weak in their hind quarters, and died in from one to three days. The sow was in a good, healthy condition. Probably indigestion was the cause of their death. The sow, after farrowing, should have boiled roots, milk, cooked cracked oats, and but little corn meal, while suckling her pigs. For the first 10 days or longer, the sow's milk is sufficient. But when the pigs are two weeks old warm milk should be given in small quantities. Young pigs should not be fed on the usual mixed food of the sows, as they cannot digest it. Pigs are mono-gastric animals, having a single stomach, and, like all such, are liable to indigestion and inflammation of the stomach and bowels. Prevention is far more efficient than treatment.

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"It will be of great service to understand the principal laws governing the growth of plants, and the application of those laws to this fruit. The method of culture most in agreement with these laws will always give the greatest promise of success. As was said at a meeting of the Maryland Horticultural Society: 'This fruit deserves systematic cultivation, instead of the careless system of a tree here and there in the corners of fences, and in wet places, untrimmed and choked by weeds.' * * *

"The aim in this manual is to furnish all needed information for the profitable cultivation of quinces in all places where they will grow. Let this fruit, for which there is no substitute, be no longer only a luxury within the means of the rich, but become so common and abundant that it may be enjoyed by all. It will greatly increase the true wealth of the nation to provide all classes with all the varieties of fruits in their seasons, and so extend the means of health and happiness."

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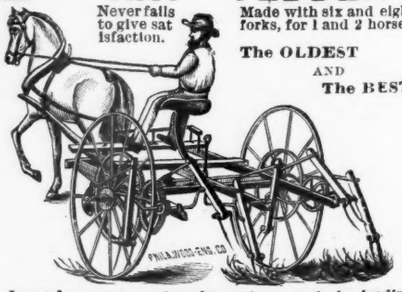

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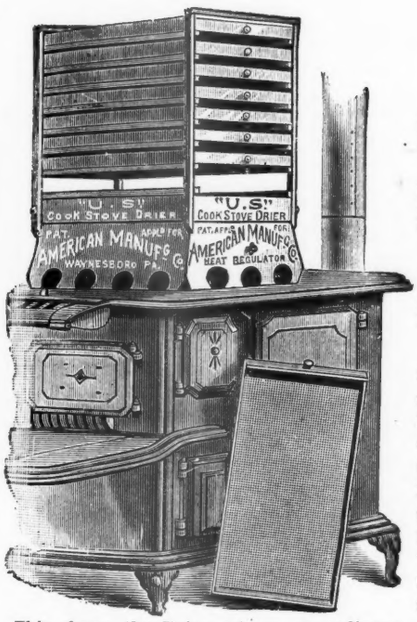

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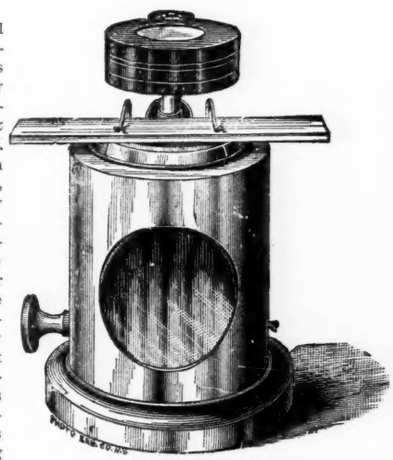

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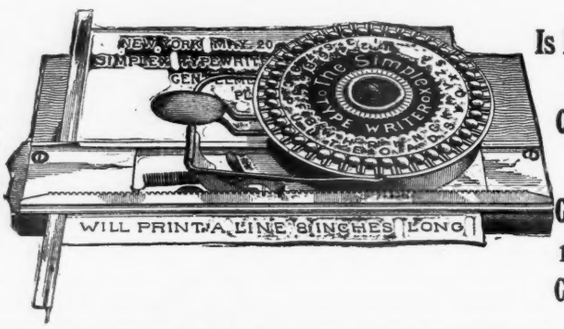

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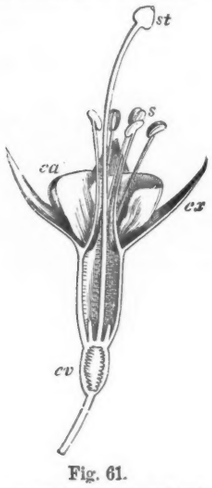

Fig. 61.
REPRODUCTIVE ORGANS OF PLANTS.

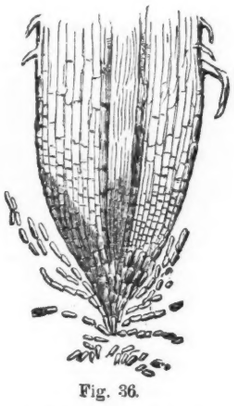

Fig. 36.
SLIP OF A BARLEY ROOT.

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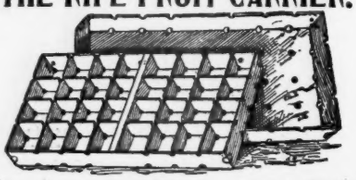

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